

SOCIAL LEARNING THEORY AND ELDERLY DRINKING:
A LONGITUDINAL STRUCTURAL EQUATION MODEL

By

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Previous research has shown social learning theory to have considerable predictive utility in explaining deviant behavior among juveniles. Recently, empirical research on social learning theory has been extended to focus on drinking behavior among the elderly. This study provides a test of social learning theory by examining the substantive issue of drinking behavior.

As part of a larger study of alcohol consumption among the elderly, face-to-face interviews were conducted on 218 respondents aged 60 and over in the age heterogeneous community of Alachua County, Florida. Respondents were interviewed on a yearly basis over a three-year period concerning their drinking practices, social relationships, personal perceptions, and attitudes about

drinking. Structural equation modeling shows that, over time, social learning theory explains a significant portion of the variance associated with drinking behavior of the elderly (86 percent). The stability of drinking behavior among the elderly is largely a function of the stability of social learning factors. Results demonstrate that social learning variables are better predictors of current drinking behavior than even information concerning past drinking behavior.

CHAPTER 1 INTRODUCTION

Research done over the past 25 years has shown social learning theory to be an important tool for explaining deviant social behavior. Until recently, the substantive issue addressed in testing social learning theory has been primarily limited to understanding the dynamics of adolescent deviant behavior. Efficacy in this area has prompted recent efforts to focus the application of social learning theory to other social groups. This is particularly appropriate considering that social learning theory is not simply a theory of deviance applicable to only specific social groups. Rather, it is a general theory of socialization that has utility in understanding social interaction processes that occur across the life span and within a variety of social contexts. Investigation of the relevance of social learning theory with other social groups has the potential of improving its generality and hence its merit as a general theory. This recent effort to broaden the application of social learning theory can be seen in work focusing on alcohol use among the elderly. This investigation continues this new line of inquiry by providing a new longitudinal test of social learning theory with specific focus on elderly drinking.

Despite the success of social learning theory there remain questions concerning the range and limits of its explanatory powers. While it has been shown to be quite robust in cross-sectional studies, only some of the research has addressed the precision with which it can be used to explain and predict behavioral stability or changes which can occur over time (see Akers and Lee, 1996; Krohn, et al., 1984). Improvement in our understanding of the sensitivity of social learning theory in detecting such change can only serve to improve its utility, elaborate its scope, and corroborate its soundness.

The general working hypothesis of the present study focuses on the relationship between social learning variables and drinking behavior among the elderly. That hypothesis, further specified in Chapter Four, is that elderly drinking and abstinence over time are explained by the major social learning variables of Definitions, Associations, and Reinforcement.

This inquiry is akin to a replication study of the research by Ronald L. Akers and Anthony J. La Greca on the processual and contextual dimensions of elderly drinking (see Akers and La Greca, 1991). The data set used here is part of their larger study of elderly drinking and employs the operationalized variables and research strategy developed by Akers and La Greca at the University of Florida. In their analysis of the larger data set, which they collected from both retirement and general communities in Florida and New Jersey, they found solid support for a causal relationship between social learning variables and elderly drinking. Further, Akers and La Greca addressed the question of how general

contextual conditions circumscribe those same social learning effects on elderly drinking behavior. Instead of evaluating either the contextual considerations or social processes singularly, their strategy examined the relationship between social learning and social context and the collective effect on elderly drinking behavior. Their study demonstrates how a macro sociological condition (community context) indirectly influences human behavior (elderly drinking) through the effects of a micro sociological process (social learning).

Akers and La Greca (1991) discussed this approach as a reasonable link for modeling "micro" and "macro" sociological connections. In the broadest sense, evaluation of the interaction processes conceptualized in social learning theory constitutes micro-sociological analysis. The physical environment, distribution of resources, normative standards, interpretive schemes, social categories, rituals, social institutions and historical trends provide the substance of macro-sociological analysis. Two fundamental questions are raised with this approach. First, how does face-to-face interaction constrain larger institutional or cultural influences? Second, and conversely, how do institutions constrain face-to-face interactions? A different interpretation of this strategy, described in detail by Turner (1991:636) conceptualizes the mutual parameters of process and context and focuses on the constraints imposed by the relationship between the different levels of analysis. Turner refers to the examination of the mutual constraints imposed by these parameters as "meso" theorizing as it attempts to link different levels of analysis. Akers and La Greca's (1991) research can be

construed as a meso-level theorizing and analysis as it places social learning theory squarely between, and linking, macro-contextual conditions (i.e. community context) and micro-behavioral outcomes (drinking behavior).

In the present study, the operational measures of social learning variables and measures of drinking are virtually the same as those specified by Akers and La Greca. It differs in three important ways;

- (1) It utilizes longitudinal data over a three year period in one community, Alachua County, Florida. These data were collected by Akers and La Greca, but have not previously been analyzed. Previous data analyses have been of the larger, first year, cross-sectional sample of 1410 respondents. The present analysis is on the smaller cohort of 218 respondents interviewed in the first year and re-interviewed in the second and third years using essentially the same interview questionnaire.
- (2) A measure of lifetime drinking patterns prior to the elderly years is included in the present analysis. This variable can be conceptualized as a "context" variable; however, it is different from the context of community Akers and La Greca used in their cross-sectional analysis. It does not reflect structural context at the community level, but rather the personal drinking background of each respondent as reported in the first year of the study. The community context variables specified by Akers and La Greca are reflective of what Akers refers to as the "*normative or cultural dimension* of the process of differential association." This dimension of social learning theory stresses the influence of

shared cultural or sub-cultural definitions emerging from one's social relationships. The *lifetime drinking pattern* variable reflects a "*social behavioral/interactional dimension* [emphasizing] "direct and indirect associations ... which are beyond those coming only from exposure to cultural definitions" (Akers, 1996:242-243). Akers and La Greca's *community context* variables emphasize the direct influence of one's current membership in a social environment. The lifetime drinking pattern variables reflect *past drinking* experiences (as occurring in some unknown social or cultural context) which directly, and indirectly, serves to influence current drinking behavior. The focus on the past drinking behavior of the respondents is in response to concerns raised by Dunham (1983) regarding problems associated with measuring drinking behavior using simple drinking frequency scales in the elderly years. Dunham argues that important information is lost when an individual's drinking history is not addressed in analyses relying on simple quantity-frequency scales of drinking behavior. Dunham further argues that by including information related to one's past drinking behavior a more comprehensive understanding of elderly drinking behavior emerges. In addition, the specification of this context variable allows for some evaluation of distinctions in types of context variables.

(3) In their study on social learning theory, community context, and elderly drinking, Akers and La Greca used structural equation techniques to test latent variable models (1991). In the present study, the same approach has been

expanded and extended to produce a series of structural models adapted to examine stability and change in elderly drinking.

There are numerous practical questions regarding changes in drinking behavior of the elderly over time. These questions are generally related to the stability of drinking patterns in the elderly, corresponding changes in drinking behavior and social learning variables, and the relationship between past and current drinking behavior. In other words, how stable are the drinking patterns of the elderly? Are trends or patterns in short-term fluctuations in drinking behavior reflected in changes in social learning variables? How is past drinking behavior related to current drinking practices? While the changes in drinking patterns of the elderly has been emphasized in previous research, little work has been done to frame theoretical explanations concerning the stability of drinking behavior among the elderly.

This investigation centers on examining two major sets of independent variables--social learning and lifetime drinking patterns--and their relationship to any recent changes in drinking behavior. Therefore, a two-fold examination is justified here. First, how are social learning variables and contextual variables integrated theoretically. Second, how does one's personal drinking history serve to balance social learning processes and, in turn, yield specific patterns of human behavior (i.e. elderly drinking behavior). Specifically, is the impact of contextual variables, as demonstrated by Akers and La Greca, ordinarily indirect through social learning variables or are the effects of some specific contextual

variables unaccounted for by social learning theory. In other words, does the introduction of a different type of contextual variable affect the theoretical model?

Finally, the issue of elderly drinking, and virtually all matters concerning the elderly, is receiving considerable popular and scholarly attention. The United States is undergoing demographic and cultural changes which will require scrupulous attention for generations to come. The "baby boom" following World War II will eventually result in an enormous elderly population in the United States which will no doubt tax our resources and our ingenuity. These children of the 1950s have overwhelmed every major institution they have encountered. They, and their horde of offspring, have swamped maternity wards, prompted the construction of new schools, and cramped the labor market opportunities for subsequent generations. As the baby boomers of the 1950s age, they will overwhelm public agencies apportioned to the service needs of the elderly. The social problems related to the drinking behavior of the elderly are no small matter of concern. In 1994 alone, alcohol and drug abuse problems associated with the elderly amounted to almost 100,000 hospital admissions and \$750 million in health care charges to the federal government (Health Care Financing Administration, 1995). Considering the rising health care costs and the projected increases in the elderly population, the economic and human costs associated with elderly drinking can only increase in the years and decades to come. In due course, the numbers and conduct of our elderly will continue to effect our society and culture for decades and generations to come. Improvements in the

theoretical understanding of the impact of such changes on the elderly can only assist in finding practical solutions to the problems we will face.

Fortunately, in anticipation of these problems, gerontological scholars have produced considerable descriptive and theoretical research regarding the extent and patterns of alcohol and drug abuse problems in our elderly population. This research has done much to specify the social characteristics and drinking patterns of the elderly. However, research concerning the dynamic factors influencing elderly drinking has generally been confined to scholarly discourse within the discipline of gerontology and limited to those theoretical perspectives. Considering the problems we can expect in the future, it is important that we develop intelligent, useful explanations concerning the determinants of drinking behavior of the elderly. Social learning theory holds considerable promise in contributing to this discourse. Therefore, the final aim of this research is to contribute to the usefulness of social learning theory as a model for framing the drinking behavior of the elderly.

CHAPTER 2 THE SOCIAL AND DEMOGRAPHIC CONTEXT OF ELDERLY DRINKING: A REVIEW OF THE LITERATURE

Introduction

The structural equation models to be used in this study specify the analysis of latent variables. Latent variables, or factors, are considered to be hypothetical or theoretical constructs which are unmeasurable and unobserved. A distinction is made between two types of factors which exist in structural equation models. Technically, exogenous factors are those factors which are caused by influences existing outside the model and are therefore unknown. Endogenous factors are those factors caused by other factors which exist within the model. The model of interest specifies the social learning variables-- Definitions, Associations, and Reinforcement, and Past Drinking as exogenous or independent factors. Current drinking constitutes the endogenous or dependent factor. However, despite assumptions that the causes of the exogenous factors are unknown, we possess a considerable body of knowledge concerning contextual factors which can influence the drinking behavior of the elderly. The factors to be investigated in this study are acknowledged to be the result of a myriad of influences which are posited to be mediated by social learning and subsequently yielding specific drinking patterns. An inventory of the

extant literature concerning elderly drinking serves to inform the models of interest by outlining the various contextual conditions that are construed to be the antecedent causes of these exogenous factors.

Therefore, this chapter focuses on 1) reviewing information related to general patterns of elderly drinking behavior, 2) methodological and conceptual issues related to alcohol abstinence, use, and abuse research and 3) the theoretical contributions which have emerged from the field of gerontology. However, considering the confusion that exists in the extant literature concerning terminology, it is necessary to begin a discussion of elderly drinking behavior with some specification of terms generally used to describe drinking behavior.

There is a plethora of terms to draw on for describing drinking behavior. These terms (i.e. abstinence, light drinking, alcohol use, social drinking, initial use, experimental use, recreational drinking, alcohol abuse, problem drinking, dysfunctional drinking, alcoholic drinking, etc.) attempt to classify and categorize drinking based on some combination of the amount and frequency of drinking behavior and the presence of any social, health, occupational, or legal problems resulting from that alcohol use. Plainly, there is no firm agreement across, and often within, academic disciplines and public institutions concerning the basic definitions of such concepts as "use", "abuse", "misuse", "addiction", "problem drinking" and even what constitutes a "drug". While these terms may seem fairly straight-forward, different institutions tend to establish their own definitions for these terms (Goode, 1993). The literature focusing solely on the concept of

"alcoholism" is, as described by Roman and Blum, a "conceptual ball of yarn ... [haunting] the sociological analysis of alcohol and alcohol problems...." They further insinuate that, considering the seemingly boundless variety of definitions used for these terms and the mountain of information on drinking behavior, attempting to synthesize these definitions and into some unified consensus is a daunting, if not impossible, task (1991:753).

For the purposes of this study, the terms *abstinence*, *alcohol use*, and *alcohol abuse* are adequate for describing the range of drinking behavior of interest. *Abstinence* refers to non-drinking. *Alcohol use* is a general term referring to a range of drinking behavior from light to heavy including what might be referred to as abusive or problem drinking. *Alcohol abuse* refers to those drinking behaviors characterized by excessive drinking which results in some type of harm and typically described as compulsive, alcoholic, problem, or deviant drinking. These terms may best be thought of as occupying a continuum with *abstinence* at one end and *alcohol abuse* at the other. Admittedly, there is considerable ambiguity with the use of these terms. Specifically, at what point does *abstinence* progress to *alcohol use* and when does *alcohol use* progress to *alcohol abuse* as manifested by some type of harm. Fortunately, in spite of the ambiguity, reasonable and valid measures of drinking patterns have been developed which are applicable to the present study. While they are, no doubt, far from perfect, they do serve to identify differences in drinking behavior regardless of the labels or stigma applied to that behavior.

Prevailing Socio-Demographic Patterns of Alcohol Use

The convergence of several significant institutional and structural conditions are important to acknowledge in framing the context of elderly drinking behavior. These general areas of concern--population trends, social conditions, institutional priorities, and cultural issues--will, or should, influence our official handling of elderly drinking behavior. In addition, issues related to the tendency of the elderly to *age out* and reduce or cease drinking and *cohort effects* reflective of historical trends and patterns constitute critical overarching themes considered to influence drinking behavior. Collectively, demographic variables, the tendency to "age out" of drinking and, the influence of historical trends on cohorts of drinkers constitute the *normative or cultural dimension* of social learning referred to earlier.

It is fairly well known that our elderly population is rapidly increasing. The current population of the United States is estimated at 263,434,000 with 12.77% or 33,648,000 aged 65 or older. By the year 2010 our population is projected to increase to over 300 million with the elderly making up 13.91%. While this may not appear to be a large increase, the actual numbers of elderly will increase to over 40 million. Our elderly population will begin to swell in spectacular numbers as the baby-boomers enter into retirement. By the year 2030 there will be 350 million people in the United States. The proportion of elderly will increase to over 20% yielding an elderly cohort of more than 70 million, more than double our current elderly population (American Almanac, 1994). Expectations regarding

their consumption of social and economic resources is clearly cause for alarm. Numerous political and economic battles will continue to rage as we attempt to respond to their growing needs. With regard to the extent of alcohol related problems with the elderly, the problems we can expect are also quite alarming. Presently, there is considerable descriptive information available which provides both an assessment of the current extent of alcohol use with the elderly and some basis for projections of elderly drinking in the years ahead.

Tables 1 & 2 provide general socio-demographic information concerning the patterns of alcohol use in the U.S. adult population. Table 1 describes the rates of annual alcohol use and Table 2 outlines the rates of daily alcohol use occurring in the general population. The rates shown in both tables are consistent with patterns described in data collected from other sources (NIDA, 1988; SAMHSA, 1994; SAMHSA, 1995a; SAMHSA, 1994b). These demographic patterns are important as they contribute to a contextual understanding of elderly drinking. Intrinsic to social learning theory, as applied to drinking behavior, is the influence of mediating social structures in affecting the patterns and rates of drinking behavior. Social learning theory is viewed as a theory that links behavioral experiences to more general contextual conditions found in the environment. These contextual conditions would include social groups, subcultures, status conditions, and the total environmental experiences of individuals which effect the operation of social learning variables (Mandolini,

Table 1: Annual Alcohol Consumption--Demographic Characteristics.
Percent of persons 18 years of age and over who had at least one drink of beer, wine, or liquor in the past year (1990).

AGE	All	Male					Female				
	18+	18+	18-29	30-44	45-64	65+	18+	18-29	30-44	45-64	65 +
All	60.7	71.8	75.6	78.3	68.4	55.6	50.7	58.5	58.2	47.6	31.3
EDUCATION LEVEL											
less than 12 years	42.6	57.8	67.2	71.2	54.0	44.2	29.2	44.4	39.2	28.5	16.6
12 years	59.8	71.9	74.6	77.7	67.3	58.7	50.3	55.8	56.5	46.4	36.4
13-15 years	68.0	76.2	79.1	78.2	74.0	61.5	60.8	64.4	61.7	59.7	49.2
16 years or more	74.2	80.6	83.3	82.3	79.1	73.5	66.4	71.8	66.4	66.5	53.9
INCOME											
Less than \$10,000	44.9	60.8	72.9	70.8	51.5	36.6	36.3	54.4	46.0	29.5	17.5
\$10,000-\$19,999	51.6	63.3	71.9	72.4	55.7	49.4	42.1	53.2	49.7	36.7	29.1
\$20,000-\$34,999	61.7	72.2	75.0	76.7	67.0	63.7	51.7	58.6	56.2	44.1	40.5
\$35,000-\$49,999	68.2	75.0	77.5	78.4	70.1	64.2	60.6	66.3	62.4	53.7	55.7
\$50,000 or more	76.0	83.6	83.2	87.1	81.2	77.3	67.9	71.2	69.9	65.0	58.4
RACE											
White	63.1	73.6	78.5	80.1	70.2	56.9	53.6	63.3	62.7	50.4	33.0
Black	46.4	62.7	64.8	71.3	57.9	39.8	33.3	36.0	40.5	30.0	15.0
HISPANIC ORIGIN											
Hispanic	52.3	69.2	66.1	76.8	66.1	54.3	37.9	41.7	42.2	29.5	23.5
Non-Hispanic	61.4	72.0	76.8	78.5	68.5	55.7	51.8	60.8	59.7	49.0	31.6
GEOGRAPHIC REGION											
Northeast	65.6	75.9	77.3	82.3	73.9	62.2	56.5	64.8	63.2	56.9	36.6
Midwest	66.4	77.1	84.1	81.9	73.4	60.2	56.5	67.0	65.4	52.7	32.6
South	52.2	65.0	69.9	74.1	59.8	45.0	40.9	49.8	49.1	35.3	22.6
West	63.2	72.6	73.3	77.2	71.0	62.0	54.5	58.0	59.5	53.0	39.9
MARITAL STATUS											
Currently married	61.9	71.7	79.5	77.9	68.1	57.3	52.1	57.5	57.4	48.2	36.1
Formerly married	51.2	72.2	85.0	83.9	72.8	50.2	42.7	62.1	63.2	46.0	27.5
Never married	64.9	72.0	72.5	76.4	61.5	47.2	56.2	58.9	56.0	47.2	32.6
EMPLOYMENT STATUS											
Currently employed	68.3	76.0	77.5	79.2	71.4	62.1	59.0	64.1	60.9	52.1	44.7
Unemployed	65.5	73.7	76.8	74.6	68.3	57.7	56.5	56.6	58.3	51.9	62.8
Not in labor force	44.6	56.8	63.0	66.4	55.3	54.2	38.7	45.2	49.6	40.9	29.5

Adapted from: Darnay, Arsen J. (ed.), Statistical Record of Older Americans. Gale Research, Inc. Detroit, MI. 1994.

Table 2: Daily Alcohol Consumption--Demographic Characteristics.
Percent of persons 18 years of age and over who had consumed an average of two or more drinks of beer, wine, or liquor per day in the past 2 weeks (1990).

AGE	All	Male					Female				
	18+	18+	18-29	30-44	45-64	65+	18+	18-29	30-44	45-64	65+
All	5.5	9.7	10.3	9.7	9.8	8.5	1.7	1.7	1.6	2.0	1.7
EDUCATION LEVEL											
less than 12 years	5.1	9.2	11.1	12.8	9.1	5.4	1.5	1.7	2.9	1.1	1.0
12 years	5.9	11.2	12.2	11.9	10.2	9.1	1.7	1.8	1.5	1.9	1.7
13-15 years	5.5	9.3	8.6	9.6	10.0	8.6	2.1	1.5	1.7	2.8	3.9
16 years or more	5.3	8.2	7.4	5.9	9.8	14.5	1.7	1.5	1.3	2.5	2.4
INCOME											
Less than \$10,000	4.8	10.0	11.3	12.6	9.0	5.8	2.0	2.6	3.5	1.8	0.6
\$10,000-\$19,999	4.9	8.8	11.4	9.2	8.3	5.7	1.7	1.4	2.4	1.7	1.6
\$20,000-\$34,999	5.8	10.3	10.8	10.5	10.5	8.3	1.5	1.6	1.2	1.6	1.8
\$35,000-\$49,999	5.6	9.3	7.6	10.3	8.0	12.8	1.5	0.8	1.3	1.8	3.6
\$50,000 or more	6.7	10.7	10.3	8.2	12.5	16.7	2.3	1.1	1.7	3.0	6.6
RACE											
White	5.8	10.1	11.0	9.7	10.4	9.0	1.8	1.9	1.6	2.1	1.9
Black	4.3	8.2	8.1	11.8	5.6	3.4	1.2	0.6	2.1	1.2	0.4
HISPANIC ORIGIN											
Hispanic	4.6	8.8	6.6	9.6	11.9	7.4	1.1	1.7	0.6	0.6	1.3
Non-Hispanic	5.6	9.8	10.8	9.7	9.7	8.5	1.8	1.6	1.8	2.1	1.7
GEOGRAPHIC REGION											
Northeast	5.4	9.9	10.9	9.9	9.4	8.9	1.6	2.4	1.2	1.3	1.4
Midwest	5.6	10.2	12.4	10.7	8.6	7.8	1.4	0.8	1.9	1.8	1.0
South	5.2	9.0	9.3	9.4	9.1	7.0	1.8	1.8	1.6	2.0	1.8
West	6.1	10.3	9.1	8.9	12.6	11.6	2.2	1.7	1.8	2.7	3.0
MARITAL STATUS											
Currently married	5.3	8.9	9.6	8.8	9.0	8.7	1.6	1.3	1.4	1.9	2.4
Formerly married	5.3	13.8	15.7	14.8	16.5	8.0	1.8	1.8	2.2	2.2	1.2
Never married	6.6	10.3	10.6	10.6	6.4	6.5	2.1	1.9	2.8	1.9	1.9
EMPLOYMENT STATUS											
Currently employed	6.1	9.6	9.7	9.6	9.6	8.6	1.9	2.0	1.5	2.1	2.5
Unemployed	9.0	15.8	20.6	12.4	11.1	20.5	1.6	0.2	2.4	1.7	9.0
Not in labor force	4.0	9.2	10.2	9.6	10.3	8.4	1.6	1.0	1.9	1.7	1.6

Adapted from: Darnay, Arsen J. (ed.), Statistical Record of Older Americans. Gale Research, Inc. Detroit, MI. 1994

1981; Akers, 1992). Therefore, it is pertinent to understand the structural conditions which can influence the social dynamics of drinking behavior.

Age

The peak years for alcohol use generally begin in the late teen years following high school and continue through the young adult years remaining relatively high until about 30 to 35 years of age. Following this initial crescendo, the annual rates of alcohol use tend to decrease as age increases. As shown in Table 1, 30-44 year old males show the highest rates of use with 78% reporting alcohol use in the past year. A considerable drop is seen in annual use rates for both men and women in the 45-64 year age group. After age 65 the rates of use again drop considerably with approximately 56% of men and 31% of women reporting alcohol use in the past year. This constitutes a relatively significant decline in overall drinking behavior as age increases. Although women tend to have considerably lower rates of annual use, the pattern of decline is similar to the decrease demonstrated by men. The daily use rates found in Table 2 show a very similar pattern regarding the age effect of drinking, particularly for men. The highest rates of daily use for men are found in the youngest age categories with rates decreasing with age.

The daily use rates for women, however, appear to be more stable. Regardless of age women tend to have relatively low rates of daily alcohol use. These drinking patterns are consistent with other descriptive research focusing on the age effects on drinking. Numerous regional and national studies have

shown this pattern regarding alcohol use in the elderly population. The overwhelming generalization that emerges from the research is that moderate alcohol use, heavy drinking, problem drinking, and alcohol abuse tend to decrease with age (Adams, 1990; Barnes, 1979; Borgatta, et al., 1982; Cahalan & Cisin 1968; ; Cahalan, Cisin, Crossley, 1974; Clark and Midanik, 1982; Drew, 1968; Fillmore and Midanik, 1984; Fitzgerald and Mulford, 1981; Holtzer et al, 1984; Knupfer and Room, 1964; Meyers, et al, 1982; Molgaard, 1990; Smart and Liban, 1981; Stall, 1987; Wechsler, et al, 1978; Wilsnak and Cheloha, 1987). This decrease appears to be a genuine age-related decline resulting in the lowest levels of alcohol use occurring in the very oldest age groups (Adams, 1990; Meyers, et al, 1981-1982; Fitzgerald and Mulford, 1981). Overall, there is considerable stability regarding the patterns of alcohol consumption over time with changes in drinking habits more likely to involve decreasing consumption. Increases in alcohol use to a level of problem drinking or alcohol abuse, following a lifetime of non-problem alcohol use or abstinence, appear to be relatively sporadic (Stall, 1986; Akers and La Greca, 1991; Akers, 1992).

Gender

It has been well established that men, regardless of age, use alcohol at higher rates and in larger quantities than women. Table 1 shows that approximately 72% of men and 59% of women report using any alcohol in the past year. Table 2 shows 10% of men and 2% of women reporting daily alcohol use. The general trend is that over time both men and women tend to reduce

their annual consumption of alcohol. However, daily use rates tend to show a rather different pattern of use for men and women. Although the annual rates for women show a substantial decline, there is relatively little change in the daily use rates for women with the various age groups. If daily use rates are any indication of potential problem use of alcohol, then there is less potential for problem drinking for women regardless of age. Women are generally more likely to abstain from alcohol use than men and if they do drink they are more likely to be light drinkers. Men tend to experience more high quantity daily drinking and attendant problems than women (NIAAA, 1987; Akers, 1992; Molgaard, et al., 1990).

Socio-Economic Status

Contrary to popular opinion depressed socioeconomic circumstances are not typically associated with high levels of alcohol consumption (Molgaard, et al., 1990; La Greca and Akers, 1991; Cahalan, et al., 1968, 1974). Despite mixed and inconsistent finding concerning socio-economic factors and alcohol use rates, the trend appears to be a positive relationship (Akers, 1992; see also Sellers, 1987). As seen in Table 1, for both men and women the rates of annual consumption increase significantly as educational levels increase. Those men and women who have less than 12 years of education report annual consumption rates of 43% and 29% respectively. Those with more than 12 years of education report considerably higher annual consumption rates, with 71% men and 63% of women reporting use. With regard to education levels and

daily use rates, age becomes an important variable. For both men and women, the daily use rates are very similar for various levels of education. However, those 65 and over with high levels of education have daily use rates more than twice that of their less educated brethren. This pattern is repeated with regard to income level for both annual and daily consumption rates. Annual consumption rates increase as does income level regardless of age for both men and women. Some of the highest rates of daily use are found among those men and women age 65 and older who have the highest levels of income. Elderly men with incomes of \$50,000 or more have a daily use rate almost three times those with incomes of \$10,000 or less. The drinking behavior of elderly women appears to follow a similar pattern. Regardless, the general trend is that those elderly with the most education and highest income tend to have the highest levels of alcohol use. There is however a general tendency for those with relatively high socio-economic status, despite high rates of use, to experience fewer problems associated with drinking than those of lower socio-economic status. While a high socio-economic status may be related to higher rates of drinking, it is not related to heavy drinking or problem drinking behavior. On the other hand, those with a lower socio-economic status, while having relatively low rates of use, tend to experience relatively more problems associated with alcohol use (Goode, 1993:177).

Race

Overall, whites show higher annual and daily alcohol use rates than blacks and Hispanics. Whites tend to use alcohol at higher rates than blacks and Hispanics with the most pronounced differences seen in the elderly cohorts. Annual use rates for white men and black men aged 65 and older are 54% and 33% respectively. Daily consumption rates show that 9% of elderly white men and 3% of elderly black men use daily. Similar patterns are again found for women with regard to their alcohol use rates. These patterns have been supported in recent work by Molgaard, et al. (1990) which indicates that the highest level of drinking occurs among white elderly men. However, while higher levels of drinking can be observed in white elderly men, regardless of race or ethnicity there is an overall tendency for decreasing alcohol consumption with increasing age. It is important to note that there are indications that the drinking behavior among blacks is quite different than it is for whites. Black men are generally characterized by a tendency to either abstain from alcohol use or to drink heavily (Harper and Saifnoorian, 1991; Brown and Tooley, 1989). Black women on the other hand tend to show some of the lowest rates of alcohol use. As seen in Tables 1 and 2, black women, particularly in the older age group, tend to have lower rates of annual and daily use than any other group regardless of other demographic factors. Explanations for this trend have generally focused on economic limitations, family responsibilities, and various social restrictions (Harper and Saifnoorian, 1991). Considering the overall socio-economic status

experienced by racial minority groups in the U.S., low rates of drinking associated with relatively high rates of problems would be consistent with patterns related to socio-economic status.

Region

Regional differences in alcohol consumption have been well documented with the South having lower rates of alcohol consumption than other areas of the U.S. Of the ten states with the lowest per capita consumption of alcohol, eight are located in the south (Hyman, et al, 1980; Linski, et al, 1991). These regional differences tend to become more pronounced with age. In very youthful drinkers the rates of drinking are virtually the same for all regions of the U.S. However, as age increases rates of drinking decrease faster in the south than in other regions (SAMHSA, 1995a). As shown in Table 1, the annual use rates for the south is considerably lower than the other regions of the U.S. In addition, the pattern seen regarding regional difference also applies to urbanization. In general, alcohol use among the youngest age groups is virtually the same regardless of whether their residence is metropolitan or rural. However, as age increases the rate of alcohol consumption becomes lower in less densely populated areas than in metropolitan communities (SAMHSA, 1995b).

Marital Status

Overall, regardless of marital status, the general tendency toward decreasing alcohol use with age is quite apparent in Table 1. Rates of drinking in the past year appear to be highest for the never married (64.9%), followed by

the currently married (61.9%) and the formerly married (51.2%). However, there are considerable variation in changes occurring in the patterns of alcohol use by marital status as individuals age. The greatest changes in drinking behavior are associated with those who are formerly married. Formerly married respondents exhibit relatively higher levels of drinking than those currently married and never married prior to the elder years. After age 65 the rates of drinking for formerly married men falls below that of currently married men and the rates for formerly married women fall below that of currently married and never married women. In fact, formerly married women present the lowest levels of alcohol use.

Indications are that rates of use and abuse, as referenced by marital status, follows a general pattern seen with other demographic variables. Currently married elderly respondents tend to display relatively higher rates of alcohol use and relatively low rates of alcohol abuse. Single, divorced and separated individuals tend to show relatively lower rates of alcohol use but higher rates of heavy drinking and alcohol abuse (Peck, 1979). Recent research tends to confirm increases in alcohol use for some widowed and divorced elderly resulting in what is known as "late-onset" alcohol abuse (Adams and Waskel, 1993), which will be discussed below. Monthly frequencies outlined in Table 2 show a similar pattern regarding recent alcohol use.

Religion

While not included in the demographic correlates of alcohol use in Tables 1 & 2, religious affiliation tends to influence both alcohol use and abuse patterns.

Overall, Catholics tend to show higher rates of alcohol use than Protestants. Among the Protestant faiths, Lutherans and Episcopalians tend to show the highest rates of use with fundamentalist Protestants, Southern Baptist, and Mormons showing the lowest rates of alcohol use (Akers, 1992:207; Goode, 1993:177; Armor, Polich, and Stambul, 1976:53-62)..

There are indications that Southern Baptist, while less likely to drink, are more likely to experience problems associated with drinking due to lower levels of acceptance for drinking by Southern Baptists. An important caveat regarding religion and alcohol use is that many of these differences in alcohol use are highly correlated with other demographic factors--region, race, ethnicity, and rural-urban residence (Goode, 1993:177).

Aging Out

There are a number of factors that contribute to the tendency for individuals to "age out" of alcohol use over the life course. One popular explanation for decreases in rates of alcohol use, particularly problem use, is that mortality is effected by heavy drinking. Numerous scholars have indicated that higher mortality rates among heavy drinkers prevents them from reaching an older age therefore resulting in lower overall rates of drinking in the elderly population (Drew, 1968; Morse, 1988; Schuckit and Pastor, 1978; Ferrini and Ferrini, 1993). There are undeniably a number of aging alcoholics who never reach old age because of drinking related problems. However, this appears to account for only a small portion of the decline in drinking rates among the elderly

in the general population (Drew, 1968; Mishara and Kastenbaum, 1980; Skog, 1991). The evidence tends to suggest that the decline in drinking rates among the elderly is more the result of social and cultural circumstances and the consequences of drinking than the result of high mortality rates (Skog, 1991).

There is convincing evidence to suggest that as individuals age, heavy alcohol use becomes less appealing due to the physical consequences associated with continued use. A number of factors combine which make it easier for individuals to cease or reduce alcohol consumption than to continue drinking. First, as individuals age most systems of the body are subject to decreased performance, endurance and vigor. Alcohol, as a drug, is potentially quite toxic with regard to acute and chronic effects even for the young and fit. Abusive drinking, which can take on many forms, can result in problems with the gastro-intestinal system, compromise liver functioning, increase the risk of cardio-vascular problems, suppress the immune system, and depress the functioning of all of the major organs including the central nervous system. There is evidence suggesting that even moderate use of alcohol on a regular basis can result in rather serious consequences for the elderly including heart disease, peptic ulcers, organic brain syndrome, mental illness and a host of other biological and psychological problems (Benschoff and Roberto, 1987; Widner and Zeichner, 1991; Morse, 1988).

Second, there are also indications that the physiological consequences of aging can effect concentrations of alcohol in the blood. This view recognizes

that as individuals age they tend to experience decreases in lean body mass and fluid levels and increases in body fat. This tends to affect the metabolism by increasing whole blood levels while decreasing the levels of plasma protein in the blood. Because many drugs, including alcohol, are dependent upon binding to plasma proteins for metabolization, lowering the level of plasma protein retards the metabolization of those substances. These changes, coupled with decreasing liver and renal functions associated with aging and the cellular dehydration resulting from alcohol use, tends to result in higher blood alcohol concentrations and alcohol reactions that are more toxic and longer lasting for elderly drinkers even at lower levels of consumption (Eckhardt, 1978; Morse, 1988; Vestal, et al, 1977; Widner and Zeichner, 1991).

Third, complications arise with regard to the effects of alcohol when used in combination with other drugs. As a group, the elderly, especially women, tend to use a variety of medications, both prescription and over-the-counter, at higher rates than the general population (Schuckit, 1977). When alcohol is used in combination with these drugs there is an increased probability of problems associated with compliance to drug regimens and a potential for detrimental drug and alcohol interactions. The synergistic effects of combining alcohol and drugs tends to compromise the effectiveness of a variety of medications prescribed for both physiological and psychological illnesses. Physicians and pharmacists routinely warn patients about harmful alcohol and drug interactions and counsel the elderly to reduce alcohol use. In effect, as age increases, the physiological

and psychological cost associated with alcohol use tend to become increasingly burdensome.

Cohort Issues

Apart from the general tendency for elders to reduce their drinking behavior due to the inherent problems of aging, there are a number of social conditions which may be related to differences in drinking patterns for particular age cohorts. These issues, while not totally independent of age, tend to focus more on social and ecological conditions that different age cohorts are exposed to during various stages of social development across the life course. Those individuals born and raised in the same era are exposed to political, social, and economic conditions which are unique, subtle and often profound in their influence on socialization. These differences in experience, or cohort effects, have raised several concerns related to alcohol use among elders, particularly with regard to the looming cohort of future elders born during the post-World War II "baby boom."

First, there has recently been an increasing focus on the effects that social conditions may play in shaping drinking behavior during the elder years. Numerous writers have raised the issue of the effects of prevailing social conditions on the drinking behavior of the elderly. (Meyers, et al, 1981-1982; Akers, 1992; Sellers, 1987; Fitzgerald and Mulford, 1981; Glantz, 1982; Holzer et al., 1984). The essence of this argument is based on the assumption that individuals born and raised during different periods in recent history are exposed

to unique social definitions and experiences related to alcohol use. Exposure to these distinctive normative standards tends to mediate and influence drinking practices throughout the life course. Those individuals who were born and raised during periods of social restraint tend to have rather conservative drinking habits while those raised during periods of social intemperance will develop more liberal attitudes and practice more capricious drinking habits. Mandolini (1981) offers the following description of the cohort differences which can affect alcohol use.

Individuals born in the 1900-1910 decade became young adults in the late teens and early 1920s. Their youth was spent in a time when alcohol was illegal, when "nice" people did not smoke and when present-day widely used illicit drugs were unknown or unavailable to the general public. Those individuals born in the 1930s passed through adolescence and young adulthood during World War II and the post war period. Alcohol and tobacco use was legal and often glamorized in motion pictures. Illicit drugs were fewer in number than today and not generally accessible to the majority of youth. The drug-related experiences of [the baby-boomers] are far different from those of the other two cohorts. The [period] of their birth [and youth] was a national period of rebellion and shifting values. They have been surrounded by models--parents, teacher, media stars, political candidates--who openly utilize and advertise alcohol and tobacco. Many youth-targeted models, such as rock stars, have glamorized illicit drug use (Mandolini, 1981: 140).

Unfortunately, this interpretation may have much merit. There is little doubt that the drinking and illicit drug use practices of the 'baby-boomers' has been nothing short of phenomenal when compared to other cohorts. The period of the 1960s is characterized by establishment of the illicit drug culture and the late 1970s marks the high point of illicit drug use in the U.S. Per capita

consumption of alcohol in the late 1970s and early 1980s is rivaled only by the intemperance of the early 1900s prior to Prohibition (Akers, 1992; Goode, 1993). In short, the baby-boomers, as a group, have the dubious distinction of having the most liberal attitudes and practices regarding drug and alcohol use of any cohort of the 20th century.

This raises certain concerns regarding the use of drugs, specifically alcohol, for the baby-boom cohort as they enter the elder years. Will the baby-boomers despite their liberal attitudes and practices display age related declines or will their practices and attitudes result in increases in the prevalence of alcohol use and attendant problems? Several researchers suggest that as the baby-boomers age we will tend to see the latter rather than the former (Fitzgerald and Mulford, 1981; Meyers et al, 1981-1982; Glantz, 1982; Holtzer et al, 1984). Additional problems may emerge with the baby-boomers related to their utilization of treatment services. Some scholars predict that as the overall educational level of our elderly increases with the aging of the baby-boomers, reluctance to participate in psychiatric services will decrease (Kahn, 1975; Schaie, 1980). There has recently been a considerable change in public opinion regarding substance abuse treatment. As we have increasingly embraced the concept of alcoholism as a disease, we have rejected the social disgrace historically associated with alcohol abuse. It has, in some cases, become 'chic' and 'heroic' to admit that one has a problem and is actively seeking treatment (Akers, 1992). There is at least a potential for increased utilization of

drug/alcohol and mental health services by future elders compared to their predecessors. Fortunately, since the early 1980s there has been a general decline in alcohol consumption for all age groups at all levels of use (SAMHSA, 1994). Despite a slight increase in alcohol consumption in the U.S. during this decade (SAMHSA, 1995b), there is at least some hope that the moderate alcohol use will continue as a trend and extend to the emerging elderly cohorts.

A third major concern arises from indications that we are seeing some convergence in the rates of drinking by men and women. Despite virtually no change in aggregate trends in alcohol use among women in the last 20 years, there are indications that some cohort differences in drinking behavior among women are emerging. Following World War II, women began increasing their labor force participation and accumulating economic resources at an unprecedented rate. By the end of the 1960s the U.S. no longer exclusively controlled the world economy. Europe and Japan were horning in on a global market that had been exclusively dominated by the U.S. since the end of World War II. Coupled with the oil embargo of 1973, the U.S. was placed squarely in the midst of an economic recession that would continue throughout the decade. These social and economic conditions essentially secured women's access to the labor market and resulted in a continuing increase in the rate at which women, out of necessity, actively participate in remunerative employment. This increase in labor force participation prompts some concern that labor force participation contributes to increases in alcohol use and attendant problems

among younger cohorts of women that will continue through the life course. As seen in Table 1, annual use rates for working women are generally higher than those for women not in the labor force. Although men continue to drink at higher levels and rates than women, this differences may not be as great as it has been in the past, particularly with younger cohorts. While there are no indications of recent increases in drinking rates among men, studies of college students indicate that the rates among young women may be increasing and in some cases approaching the rates of young men (Engs and Hanson, 1987; Gomberg, 1991; Johnston, et al, 1988). This increase in drinking rates among young women may be offset by an aging baby-boom cohort of women who tend to report age related decreases in rates of alcohol consumption. This result is the appearance of a relatively stable aggregate rate of drinking behavior for women (Gomberg, 1991). However, younger women who are experiencing greater labor force participation and higher levels of education may be drinking at higher rates than the previous cohort. Furthermore, if this is the case, there is some concern associated with changes in drinking rates of women as their labor force participation continues to increase (Gomberg, 1991). If women are increasing their alcohol use as they increase their labor force participation, much the same questions emerge as seen with the baby-boom cohort in general. Namely, will more liberal attitudes and practices translate into a higher prevalence of alcohol use as the cohort ages? No doubt, an important direction for future research lies in the affect of labor force participation on the drinking behavior of women.

The general concern, therefore, is that what has gone before may not hold for future cohorts of elders. It is quite reasonable to expect that, despite the general tendency for drinking to diminish with advancing age, aging 'baby boomers' may display higher rates of drinking behavior than our present cohort of elders. More liberal attitudes about drinking, increases in drinking behavior by women, and ready access to alcohol abuse treatment may result in substantial changes in our perception of elderly drinking in the decades to come. Not only might the overall rates of drinking and problem drinking increase but heretofore undetected problem drinking cases may be more readily detected. Should these concerns become a reality, the strain could prove onerous for those clinicians, researchers, and organizations attending directly to the problems of alcohol abuse and addiction among elders.

As seen, from the information available to date, there are characteristic changes that occur in the drinking patterns of individuals across the life course. These changes can be typified by a general decrease in drinking as the result of age effects. There are, however, a variety of influences which can mediate and influence this overall pattern. Specifically, there are indication that socio-economic factors, gender, and status differences can influence the likelihood of drinking, problem drinking, and alcoholism. In addition, there is a strong suggestion that the effect of historical circumstances may prove to have considerable influence on drinking patterns for particular cohorts. However, fueled by apparent differences in the agenda and focus of researchers

attempting to elucidate the characteristics of elderly drinking behavior, continued debate concerning the extent and correlates of elderly drinking remains quite prominent in the literature.

Elderly Alcohol Abuse: Methodological and Conceptual Issues

Numerous studies have been conducted in recent years to attempt to identify characteristics associated with elderly alcohol abuse problems. The descriptions of alcohol use by elders discussed to this point have focused on the general pattern of alcohol use in the aggregate population. However, despite relatively low levels of alcohol use in the general population and the tendency to reduce drinking with increasing age, it would be naive to conclude that alcohol problems do not exist among our elders. Clinical and etiological studies have described significant problems with the elderly regarding patterns of excessive alcohol use. These studies have estimated the rate of problem elderly drinkers accessing various medical and treatment services as ranging from 10% to 58% (Gurnak and Thomas, 1989; Brody, 1982, Gornberg, 1982, Mishara and Kastenbaum, 1980).

Although, such rates of alcohol abuse are not supported by research focusing on the general population, clinical research focusing on the prevalence of alcohol related problems in the elderly cannot be dismissed. It is critical to bear in mind that data focusing on general trends in the population are quite different than studies that emerge from clinical settings focusing on treatment concerns. A basic difference is that clinical studies tend to focus specifically on

the detection of alcohol abuse and alcoholism while much of the survey research attempts to ascertain more general patterns of alcohol use. In reviewing research concerning alcohol use, alcohol abuse, or alcoholism it is crucial to recognize the level of analysis at which that research focuses and the nature of the problem being evaluated. The neglect of these considerations has resulted in a fair amount of confusion in the literature concerning the nature of alcohol use patterns among the elderly. Sellers (1987) outlines the root of this confusion as a two-fold problem related to 1) methodological differences and 2) definitions of alcohol use.

First, there are fundamental methodological differences in much of the previous, and continuing, research. These methodological differences tend to bias results and subsequent interpretations concerning the extent of alcohol problems with elders. It is reasonable to anticipate that survey research focusing on population and community samples will tend to omit those drinkers, problem drinkers and alcoholics who are institutionalized, living in structured residential settings, or otherwise in treatment for medical conditions or alcoholism. Because of an increased tendency for the elderly to be living in formally administered residential settings there is an increased likelihood of underreporting of drinking, particularly problem drinking, among the elderly. Conversely, it is reasonable to expect that there may be a proportional overrepresentation of elderly problem drinkers and alcoholics found in various institutional settings. While research estimates of alcoholism in the general elderly population are placed at between

2% and 10%, the estimates reported in institutional settings appears to be quite a bit higher (Atkinson and Schuckit, 1983; Schuckit and Miller, 1976; Barnes, 1982; Brody, 1985; Gomberg, 1980; Widner and Zeichner, 1991). Estimates of alcoholism in acute care hospitals have been placed at between 11% and 20% (Curtis, et al, 1989; Bristow and Clare, 1992; Schuckit and Miller, 1976). Studies focusing on psychiatric facility admission report elderly alcoholic admission rate of between 17% and 44% (Zimberg, 1978; Gaitz and Baer, 1971; Kosberg and McCarthy, 1985). Reviews of nursing home estimates place alcoholism rates at around 20% (Mishara and Kastenbaum, 1980; Schuckit and Pastor, 1978).

Such differences between survey research focusing on the general population and clinical/residential settings are not surprising. Elders who abuse alcohol or have been diagnosed as alcoholics tend to smoke more, have a higher incidence of chronic lung disease and heart disease, have a greater incidence of organic neurological impairment, and make more suicide attempts (Gurnak and Thomas, 1989; Widner and Zeichner, 1991). It seems reasonable to assume that the continuation of alcohol use, particularly heavy use, into the elderly years would contribute to increased contact with medical, psychiatric, and social service institutions. Nevertheless, such reports have prompted some researchers to conclude that there is considerable "invisible" or "hidden" alcohol abuse among the elderly population which is simply not detected in studies focusing on rates of alcohol use in the general population.

Several researcher working in clinical areas have outlined their rationale for suspecting that much of the alcohol abuse problems with the elderly are under-estimated or undetected (Widner and Zeichner, 1991; Gurnac and Thomas, 1989, Zimberg, 1974). This is primarily because the elderly do not experience the social and legal problems associated with alcohol that younger cohorts encounter. Younger alcohol abusers are usually detected by problems associated with employment, family disruptions or legal entanglements. These approaches to detecting alcohol abuse with the elderly are less productive since many elderly are retired and therefore do not experience problems with work. Family disruptions are less frequent and the elderly do not experience frequent legal problems. Elderly alcohol abusers are more likely to enter some type of treatment program through the medical establishment than are the non-elderly. Conversely, younger cohorts are more likely to enter treatment programs as a result of legal problems (Dunham, 1986). Just as alcohol use tends to decline with increasing age, so does the incidence of legal problems. The elderly are responsible for less than 1% of the crimes committed in the U.S. despite comprising over 12% of the population. (Forsyth & Gramling, 1988; American Almanac, 1994).

Additional reasons cited for under-estimations of elderly drinking include:

1. Social stereotypes concerning what constitutes alcoholic behavior and which groups are prone to alcohol related problems tends to bias health professionals in their diagnostic evaluations (Beinenfeld, 1987, Schuckit and Pastor, 1978)
2. The elderly tend not to display many of characteristic symptoms and classic signs of alcoholism. (Beinenfeld, 1987)

3. The clinical presentation of the elderly is often confused or compounded by problems associated with the process of aging (often supported by the misinterpretations of family members) (Beinenfeld, 1987; Blazer and Pennypacker, 1984)
4. The elderly are seldom mentioned in official records of alcohol related incidents (i.e., DUI's or injurious behavior) (Atkinson and Schuckit, 1983)
5. Diagnostic instruments used for measuring alcohol problem, while valid for younger populations, may not be appropriate for elders and underestimate the rates of alcoholism in the elderly. What constitutes light or moderate drinking for younger individuals may be quite different for elders. (Beresford, et al, 1988, Graham, 1986; Schuckit and Pastor, 1978; Mishara and Kastenbaum, 1980)
6. The elderly may tend to underreport their drinking behavior, particularly those raised in a temperance atmosphere (Barnes, 1982; Eckhardt, 1978; Brody, 1982; Widner and Zeichner, 1991)

No doubt, there is considerable reason to believe that some alcohol abuse among the elderly that remains hidden. It would be erroneous to minimize the extent of alcohol problems among the elderly based on aggregate trends in drinking behavior. Despite the general trend toward reductions in alcohol use associated with aging it would be, as noted by Pruzinski (1987, p.83), "irresponsible for... service providers to sit back and wait for autonomous recoveries in those alcoholics or problem drinkers who survive long enough." By the same token it is erroneous to extrapolate clinical results to aggregate patterns of alcohol use in the general population (see Zimberg, 1978).

While population studies show that alcohol use rates are fairly low for the elderly, researchers drawing their samples from medical and clinical settings, nursing home, or residential communities are faced with a quite different

representation of elderly drinking behavior. As noted by Mishara and Kastenbaum (1980, p.63):

Perhaps the difference in opinion stems from one's perspective. Researchers may find that compared to other age groups, alcohol poses very little problem for most elderly people or that among all the problems elderly people face, alcohol is one of the less important difficulties. This is no solace to the practitioner who is trying to help an older person with his alcohol problems or a general hospital director faced with a high proportion of hospital admissions consisting of older people with alcohol-related complications. Even if, as the survey data suggest, alcoholism and alcohol abuse are less frequent, it still exists and can pose a serious disruption to the life of the older person. It also affects a large constellation of friends, family members, and medical and social service agencies.

The second problem noted by Sellers (1987) has to do with the untidy business of dealing with the various definitions of and criteria for alcohol use, alcohol abuse, problem drinking, and alcoholism. Schuckit and Pastor (1978) have outlined some of the problems associated with definitions and alcohol use terminology in research. They delineate three different types of criteria used in assessing alcohol use and abuse patterns. First, there is the *addiction approach* which includes both the concepts of physical and psychological addiction. By definition, physical addiction is rooted in the physiological dependency generally associated with heavy opiate and alcohol use. Addiction, in this context, is the result of progressive, increasing dependence of the body on certain drugs. The body develops a *tolerance* to the presence of the drug in the system and continued use of the drug is required to maintain physiological homeostasis. The ability of the body to adapt to the toxic effects of the drug results in physiological

need to continue the use of the drug. If an individual is addicted, then cessation of drug use results in *withdrawal symptoms*. Classic withdrawal symptoms associated with alcohol are typically characterized by hallucinations, affective disorders, tremors and various other complications including seizures and perilous hypertension. Psychological addiction definitions focus on more subjective and less quantitative measures of addiction. The emphasis here is more on the felt need or the presence of a compulsion to drink without the presence of a physiological dependency. Although the concepts of physical addictions and psychological addiction are not mutually exclusive, they do represent general points of contention and topics of debate in alcohol studies and diagnostic practices. Psychological definitions of addiction are more modern conceptualizations emerging from the increased prevalence of the illicit drugs (i.e., cocaine, marijuana, amphetamines, hallucinogens) which, while quite dangerous, do not result in the presence of classic withdrawal symptoms upon cessation. Individuals may become irritable and ill-tempered, report intense cravings, and experience some minor physical discomfort, however, no physiological tolerance is established.

Second, there is the *social-problems approach* which is, in practice, synonymous with the "medical model" concept of alcoholism as a disease. This approach essentially states that the disease of alcoholism is manifested by a number of personal and social problems that emerge as a consequence of excessive drinking. Specifically, marital disruptions, employment problems, legal

entanglements, and health hazards associated with alcohol use become evidence of alcohol abuse, problem drinking, or alcoholism (depending upon institutional preferences). Three of these criteria are compromised by the tendency for the elderly to be less likely to be married, less likely to be employed, and less likely to be involved in criminal activity (American Almanac, 1994; Schuckit and Pastor, 1978). The fourth criterion is compromised by the way in which alcohol related problems are identified by service providers. Unfortunately, many alcohol abuse problems are brought to the attention of medical service providers only as an attendant condition to other presenting problems. In addition, there are indications that physicians often have limited knowledge of, or interest in, alcohol problems among the elderly (Mignon, 1993-1994)

One sub-category of this *social-problems approach*, "late-onset alcoholism", has been given considerable attention in the literature on elderly drinking. This hypothesis states that while alcohol problems typically emerge with younger age groups, there are some elderly who develop alcohol problems despite a lifetime of benign alcohol use. It is typically argued that late onset alcoholism emerges as a response to the significance social and personal changes that tend to occur with aging. Four major factors are considered to contribute to increased alcohol abuse among the elderly (Brody, 1982). First, there is considered to be significant changes associated with aging due to retirement from remunerative employment. Income is generally reduced and

there are changes of social status associated with employment, retirement, and the reorganization of family relationships. Coupled with feelings of boredom due to a lack of structured activities this results in increases in alcohol use. Second, there is a recognition by the elderly that people are dying around them and a knowledge of more deaths to come. This recognition results in considerable depression and provokes increased alcohol use. Third, deterioration in health, increasing physical limitations, and discomfort contribute to increased problems with alcohol use. Lastly, loneliness and isolation contribute to increased levels of alcohol consumption, particularly for elderly women who outlive their husbands. The result is that alcohol use becomes a strategy of coping with the increased stress and problems associated with aging. Furthermore, the compounding of these problems over-time is considered to be so emotionally fatiguing that even succoring by the social network is insufficient to mediate these misfortunes (Jennisen, 1992).

While it would be difficult to argue that cases of late onset alcoholism do not occur, such occurrences would have to be considered sporadic. There has been little research done that would confirm these features as contributing to increased alcohol problems or that late-onset alcoholism occurs with high frequency among the elderly. There is little evidence in the literature that supports speculation concerning late-onset alcoholism. As critiqued by Borgatta, Montgomery, and Borgatta (1982), there are three major shortcomings of this assertion. First, although discussed repeatedly in the gerontological literature,

most of the references lack supporting data and the discussion of late-onset alcoholism is based more on faith than empirical support. Second, by definition, the concept of late-onset alcoholism does not imply that the elderly start drinking in their old age, only that their alcoholism problems become manifest in old age. In addition, questions emerge concerning distinguishing between early-onset and late-onset methodologically. For example, is late-onset alcoholism after the age of 50 (Rosin and Glatt, 1971) or is it after the age of 40 (Schuckit and Miller, 1976; Atkinson, et al, 1985)? Third, the overt assumption of causality which is based on stressful life-events provoking increases in drinking behavior has, for the most part, not been substantiated in the research (Akers and La Greca, 1991; Bell, et al, 1976). Those clinical studies that do support stress related late-onset alcoholism account for only a small portion of elderly drinking (Atkinson, 1987; Christopherson et al, 1984; Schuckit, et al., 1993). As summarized in the conclusion of one study, Akers notes (1992:205):

If late-onset problem drinking does occur, it is most likely to occur in those older adults who enter later life having already developed a pattern of heavy drinking. It is not likely to be provoked by stressful life events; the elderly are, by and large, quite capable of dealing with them without the recourse to alcohol. They deal with stress in old age the way they learned to deal with it in younger years--by drawing on their own coping skills and leaning on supportive other. There is no association between the occurrence of life events and the frequency, quantity, or problems of drinking behavior among the elderly (La Greca, Akers, and Dwyer, 1988).

Nevertheless, considerable controversy does exist in the literature concerning the notion of late-onset of alcohol abuse. The issue of late-onset

alcoholism may be one of those debates that is, as Skog (1991, p. 591) describes, "hopelessly static" and rooted more in the social construction of an alcohol problem than empirical evidence (Goode, 1993). Considering that alcoholism and alcohol problems are generally considered to be caused by multiple factors (most of which are still not understood) it is curious that a single cause (stress) continues to be underscored as grounds for drinking by a single group (elders) despite limited empirical support. Again, this may be simply a matter of perspective. Those working in clinical setting have different priorities than researchers attempting to understand general use patterns. No doubt, this debate will continue for some time to come and recent efforts indicate that interring the concept of late-onset alcoholism might be premature. A recent study by Adams and Waskel (1993) has raised the hypothesis that although late-onset alcoholism is infrequent, when it does occur, the causes may be related to structural conditions rather than stress conditions. Their research shows that a greater number of late-onset alcoholics were divorced or widowed when compared to early-onset alcoholics who are typically married. They speculate that a spouse may serve to regulate and manage their mate's drinking behavior. The loss of that regulatory control through death or divorce may increase the likelihood of alcohol problems developing. Such an interpretation would expand the explanations offered by previous research supporting the influence of isolation and social network changes on drinking behavior (Brown and Chiang, 1983-1984). This social control hypothesis may help to reconcile the disciplinary

divisions that have emerged (Valiant, 1983) and is certainly a worthwhile direction for future research.

Lastly, and perhaps most importantly, is the *socio-normative approach* which includes the various quantity-frequency measures used in assessing drinking patterns. Generally the strategy here is to distinguish between deviant and non-deviant drinking patterns and behavior based on some combination of the amount and frequency of alcohol used. Typically, the frequency of drinking and the usual quantity of alcohol used at a sitting are combined to yield ordinal categories of drinking behavior. Unfortunately, such approaches tend to be circumscribed by the complexity and variations of drinking norms which can change with regard to sex, ethnicity, race, culture and socioeconomic divisions. The limitations of these measures tends to be compounded by the apparent shifting drinking norms and practices that occur with advancing age. As indicated previously, normative definitions applied to younger drinkers may not be appropriate when assessing the drinking habits of elders. With elders, even the minimal use of alcohol may have deleterious consequences and the application of normative standards concerning drinking by elders may be misleading. Current research tends to indicate that the measures used to assess alcohol problems in the elderly are often wholly inappropriate (Graham, 1986).

In addition, the measures of alcohol use based on some variation of a quantity-frequency index generally do not allow for variation in patterns of drinking behavior over time. As noted by Dunham,

If highly variable drinking patterns are common, then a measure with the depth of one to six months or even one year could very easily catch an alcoholic or problem drinker during a dry period or during a period of rather moderate or controlled drinking. Conversely, it could catch an otherwise moderate drinker during a period of uncharacteristically heavy drinking. Such errors could introduce a substantial bias into research findings (1983: 486).

Furthermore, while a single quantity-frequency indicator may be quite appropriate for those whose drinking is considered to be light or moderate, it can prove limiting for heavy drinkers or problem drinkers who characteristically have significant variability in their drinking behavior (Polich, et al, 1980). The tradition of measuring overall drinking behavior based on a quantity-frequency index of current or recent drinking practices represents a striking shortcoming in previous research. This is of particular concern since some type of normative standard constitutes the definitive factor in specifying drinking problems with both the *addictions approach* and the *social problems approach*. Measures of alcohol use which do not allow for variations in drinking patterns over time can yield information which is limited in accurately representing overall drinking patterns. Such limitations at this level hampers the ability of researchers and clinicians to specify the context of current drinking behavior, predict potential problems associated with drinking, and devise prevention and treatment strategies.

Research by Dunham (1983) offers some improvement in this approach by utilizing retrospective data and longitudinal data to increase the specification of drinking patterns. His work outlines unique subtleties or changes in drinking behavior not captured in the use of more conventional quantity-frequency indexes. His analysis shows seven basic lifetime drinking patterns as follows: (1) Life-long abstainers (2) Rise and fall--basically light drinkers with period of increased use above light drinking but subsequently returning to light drinking. (3) Rise and sustained--initially light drinkers whose drinking rose above light drinking and was sustained throughout their life. (4) Light throughout life--lifetime light drinkers. (5) Light with late rise--lifetime light drinkers who experienced and increase above light drinking after age 60. (6) Late starters--abstainers who became drinkers after the age of 40. (7) Highly variable--drinkers who crossed over between light and moderate drinking three or more times during their lifetime (1983: 490). Despite the ambiguity of these categories, this typology does offer a viable and potentially profitable alternative to traditional quantity-frequency indexes. As noted by Dunham, the refinement and development of these measures is necessary considering our growing knowledge about drinking patterns (1983: 492).

Dunham's argument reflects the *behavior/interactional dimension* of social learning previously discussed. The examination of perceptions of past drinking behavior allows for stipulating the direct influence of personal experiences and behavior and, to a lesser degree, the indirect influence of historical and cultural

conditions. As stated previously, part of the goal of the present study is to examine the utility of information related to past drinking following Dunham's recommendations.

Gerontological Perspectives

In addition to the socio-demographic and conceptual matters discussed to this point, an additional body of knowledge offers considerable contributions to our understanding of the elderly condition. The elderly do constitute a distinct social group in our society and their condition and needs have received considerable attention in recent decades. Just as demographic and conceptual considerations hint to the antecedent causes of the social learning, past drinking and current drinking factors, the gerontological theories also serve to inform and frame those same antecedent causes. Since the 1950s, there has been a wealth of information generated by gerontological researchers and a number of pertinent theories of aging have emerged to increase our understanding of the social condition of the elderly. While many of these theories fall short in explanations of deviant behavior among elders, they do provide perspectives which specifically focus on the conditions of the elderly as a unique social group.

Gerontological theories have emerged as a result of social sentiment holding that the elderly have experienced a unique change in their basic social condition during the 20th century. These changes are considered to have resulted in increasing social isolation and a loss of purpose and meaning in the

lives of elders (Brown, 1996). The result has been that the event of growing old has come to constitute a "social problem". As described by Peck:

Aging has emerged as an important area of study.... One of the reasons for this emergence is the viewing of aging as a social problem. It often has come to be viewed as a social problem because older people became more visible as their numbers increased, urbanization and industrialization produced changes which undercut the traditional position of the older person in society, and the fast pace of change in urban industrial societies created obstacles to social adjustment in terms of accommodating an increase number and proportion of older people (Atcheley, 1972). Since World War II, society has increasingly withdrawn from its older members. For example, the labor of older people is generally neither sought nor desired (Peck, 1979, 64).

Nearly all of the gerontological theories have emerged from two general theoretical paradigms (Estes, et al., 1992) which are reflective of this sentiment. First, there are those theories rooted in structural-functional explanations of characteristics associated with aging. These theories focus on an underlying assumption that the natural state of society is one of cohesion and homeostasis. Theoretical explanations of this ilk offer interpretations which emphasize either the functional or the dysfunctional consequences of withdrawing from mainstream social activity which is characteristic of aging in a modern society. Second, there are bio-medical theories which focus on a biological basis for understanding the unique conditions of the elderly. These theories tend to stress the declining health and vigor associated with aging as the foundation for understanding the behaviors and habits of the elderly. As can be seen from the previous discussion, the bulk of research on the elderly has emphasized these

descriptive characteristics of elderly drinking with particular attention to the practical consideration of aging. No doubt, research forged from these gerontological grounds has yielded an abundance of descriptive knowledge. However, the emphasis on functionalist perspective has limited heuristic value in developing a theoretical understanding of how social conditions influence elderly drinking. Nevertheless, several specific gerontological theories need to be acknowledged for pioneering contributions to an understanding of elderly drinking. The development of these theories has clearly opened the door for the application of rival perspectives to help explain elderly drinking behavior. The following outlines the major gerontological theories and their principal vulnerabilities.

Activity Theory

Considered the first of the gerontological theories, activity theory focuses on the assumption that the problems of aging are the result of inactivity. Evolving from "implicity theory" which emphasizes the benefits of social interaction and institutional participation (Sellers, 1987), this theory hypothesizes that the elderly have the same need for social activity that younger adults have. Successful adjustment to aging is therefore rooted in the maintenance of an active lifestyle that promotes a sense of well being and efficacy. Those who maintain an active lifestyle are happier and better adjusted than those who don't (Havighurst, et al., 1968; Brown, 1996). Although some research has shown that activity levels are related to self-worth (Tobin and Neugarten, 1961), it has yet to

be established that there is any causal relationship between activity and problems of the elderly (Brown, 1996; Lemon, et al., 1972). Brown (1996) outlines the following considerations resulting in the failure of activity theory as a viable explanation of problems among the elderly:

1. No distinction is made between whether changes in activity levels are voluntary or involuntary.
2. No distinctions are made with regard to the types of activities elders participate in and which of those activities promote efficacy and well-being.
3. Values concerning activity preferences may be different for the elderly than for younger or middle-aged adults.
4. No considerations are made concerning what constitutes desirable levels of activity for the elderly.
5. No considerations are made concerning the causal processes leading to inactivity among the elderly (Brown, 1996:84).

The overall failure of activity theory is its overly simplistic explanation of causes of efficacy with the elderly. It is a theory which not only fails to address activity preferences of the elderly but contradicts research indicating that the elderly tend to prefer lower levels of activity and more solitude in their lives (Atcheley, 1991; Larson, et al., 1985). Because of the lack of empirical support for activity theory, it has, by and large, been dismissed as a usable gerontological theory.

Disengagement Theory

Originally outlined by Cummings and Henry (1961), disengagement theory epitomizes functionalist explanations of social behavior with the elderly. While

recognizing that certain conditions of the elderly are problematic, on the whole social disengagement is both socially and personally functional. Elders are presented with an opportunity to retreat from the demands of institutional involvement and lead a more genteel life. For society as a whole, social disengagement operates to ameliorate the grief associated with the impending impairment and ultimate death of our elders. Disengagement theory frames the social withdrawal of the elderly as a generally gradual, natural and positive process. Unfortunately, little research has supported the viability of this theory. Indications are that few generalization concerning disengagement can be made about the elderly since many do not socially disengage during the course of aging (Brown, 1974; Tallman and Kutner, 1970; Brown, 1996). Many stay quite active and consistently maintain and continue to develop their social networks. Additional problems regarding disengagement theory include it's limited application to situations experienced by the elderly in the U.S., tendencies for restrictions in social activity to be abrupt rather than gradual for the elderly, and inadequacy in addressing the social context and personal experiences of elders (Brown, 1996:86).

Loss of Major Life Roles Theory

While not considered a formal theory in the sense of disengagement or activity theory, the issue of loss of social roles has been an accepted theme prevalent in gerontological research since the early 1960s. This approach emerges from a perception that the elderly have, as a group, lost the social

status associated with their occupations due to retirement (Rosow, 1974).

Assuming that a crucial aspect of socialization is manifested by the assignment of role specifications which delineate social status, a loss of occupational status results in a state of "rolelessness" for the elderly. Furthermore, the loss of occupational roles effects the dynamics of other ancillary roles in the social network. Ensuing changes in civic and family roles only serve to further alienate elders. The loss of occupational roles, changing involvement in community activities, and role confusion in marital and family relationships results in a loss of definition, purpose and sense of identity for the elderly. (Brown, 1996:87-90)

While there may be some merit to this position, it is doubtful that this is a condition that is pervasive among the elderly. Three major considerations are not addressed in the loss of roles hypothesis. First, there may be a false assumption that the status position of the elderly can be characterized as a condition of "rolelessness." Perhaps the roles of the elderly are not vague at all. Retirement roles, while perhaps not as clearly delineated as occupational roles, are nonetheless often anticipated, planned, and successfully established (Atcheley, 1991, 119-121). Second, the loss of roles theory was conceived when mandatory retirement programs were being established in the U.S. in the 1960s. While forced retirement may have had detrimental effects on role continuity for the elderly at that time, such an effect may have been long since mediated by changing expectations and the institutionalization of retirement in the U.S. (Brown, 1996). Third, there can be little doubt the loss of status and

role responsibility among elders is culturally bound. Elders in different societies do not necessarily experience such problems. As noted by Brown,

The loss of major life roles theory was clearly both time bound and culturally bound, It was at least partially valid during the 1960s in America, but was less valid as time passed and in other cultures.... [A] sizable majority of those who were retired, even in the 1960s, claimed to enjoy retirement and to be highly satisfied with life in old age. (1996: 89)

Continuity Theory

Perhaps of all the gerontological theories, continuity theory holds the most promise. Continuity theory hypothesizes that there is considerable consistency across the life course concerning one's engagement in a social network and various social activities. Those individuals who tend to be active in a social network prior to reaching old age tend to continue to do so through their elderly years. Those who are less disposed to maintaining social connections in younger years tend to continue with that pattern as elders. Continuity theory has received some empirical support over the years (Videbeck and Knox, 1965; Maddox, 1970; Havinhurst, et al., 1968; Neugaarten, et al., 1968; Maddox and Douglas, 1976) but essentially lacked a scope which would establish it as a sociological theory. With its emphasis on personality characteristics, continuity theory has been criticized as ignoring social factors which can mediate individual tendencies regarding social integration and therefore more applicable to counseling psychology for addressing clinical issues (Sellers, 1987). Recent efforts to resolve some of this criticism has focused on incorporating concepts

related to the influence of social environment and conditions in mediating individual tendencies (Covey, 1981; Atcheley, 1989). While such efforts have come closer to placing continuity theory in a sociological context, much development of the theory is still needed.

Summary

The theories outlined here represent the most familiar and popular themes in gerontology for understanding the conditions of elderly life. There are a host of other theories that attempt to explain the unique conditions faced by elders in the U.S. Reconstruction theory draws on the basic tenets of labeling theory to explain the social disengagement of the elderly (Kuypers and Bengston, 1973). Other theorists have focused on the loss of social status theme and offered explanations derived from exchange theory (Dowd, 1975: 1980), modernization theory (Cowgill and Holmes, 1972), and stratification theory (Riley, 1971). Marxist conflict perspectives have been applied in the form of political economy theory (Bonanno and Calasanti, 1988) and symbolic interaction perspectives emphasizing sub-culture conditions have also been addressed (Rose, 1965).

Many of these themes are readily observable in the extant literature on elderly drinking. No doubt, issues of social integration have played a dominant role in our understanding of the drinking habits of the elderly. There are, however, several notable problems with these theoretical approaches when applied to the issue of elderly drinking. First, many of these theories are culturally bound and applicable only to specific times and places. Furthermore,

while they do offer insight into historical conditions and lay foundations for theoretical development, many of these approaches are further bound by the structural-functional inclinations of the originators of these theories (Brown, 1996). Second, most of these theories tend to treat the condition of the elderly as peculiar only to that particular age group and uniquely problematic. By emphasizing a deterministic life cycle model of aging, there is a failure to place aging in any developmental context emphasizing socialization processes that extend into the elder years. It seems perfunctory to generalize that reaching old age is considered a distressing or even a surprising event for most people. It may be safer to assume that since most elders have a lifetime of experience to draw on, they may be better prepared to cope with crisis and loss than youngsters. One does not have to reach the elder years before the chivalrous invincibility of youth has been forsaken. No doubt, simply reaching old age involves a lifetime of experience in coping with crisis, loss, and grief. However, while the loss of vigor associated with increasing age can be distasteful, elders may not be as maudlin about aging as youngsters believe them to be. As previously noted by Akers (1992), the elderly are on the whole, quite capable of dealing with stresses of old age. Finally, gerontological theories, in their present state, lack the scope necessary for analyzing the drinking behavior of the elderly. The vast majority of all research done in the area of elderly drinking has focused on gerontological issues intermingled with medical considerations. This gerontological persuasion and its attendant theories, on the whole, tend to focus

on specific issues and the practical problems associated with aging (Brown, 1996; Sellers, 1988). As a result, the majority of the literature in this area has been primarily of a descriptive nature. Fortunately, this work has been fruitful for identifying the characteristics of elderly drinking and laying solid foundations for theory driven research. Unfortunately, despite a plethora of descriptive research, little theoretical work has been done to address elderly drinking in the disciplinary arena most conducive to investigation--deviance and deviant behavior. As described by Sellers (1988):

[G]erontologists appear to be disproportionately concerned with the practical implications of growing old rather than with its theoretical implications... All [gerontological theories] are viewed to be of limited utility in the explanation of elderly deviant behavior, even if empirical testing were to provide support for their hypothesis. The basic problem with using any gerontological theory or conceptual framework to explain deviance is that they focus their explanations on the levels of morale, or life satisfaction, displayed by older adults. To employ any of these theories as an explanation of deviance would require an "assumption" that deviant behavior is consonant with dissatisfaction with life.... Theory relevant to elderly drinking behavior is more likely to be found in the deviance literature (pp. 24-29).

As shown from the previous discussion, relationships between social disengagement and the effects of crisis events has yielded little insight into the social basis of drinking behavior in the elderly. Furthermore, what has been done is fraught with problematic key concepts, troublesome operational definitions, and conceptual misgivings (Montgomery and Borgatta, 1986). Regarding the issue of elderly drinking, gerontological theories have generally failed to provide sweeping contributions to a sociological understanding of why

some elderly drink and some don't. Much of this problem can be attributed to the focus of gerontological theories. Gerontological theories focus on the problems of aging in a very general sense. They are limited in their scope to the process of aging and not developmental and learning process, deviance, or drinking behavior. Typically, gerontological theories are ill equipped in either their focus or scope for evaluating either deviant or non-deviant elderly drinking behavior. While some gerontological theories are quite adequate in responding to questions concerning contextual conditions, they are generally inadequate for evaluating matters related to definitions of deviance, normative standards for drinking behavior, learning process associated with conventional and deviant behavior, and the influence of contextual factors on the developmental process. The major concerns regarding gerontological explanations of drinking behavior are not related to the range of drinking behavior, rather the focus is essentially fixed in the consequences of problem alcohol use. Therefore, approaches rooted in theoretical foundations of deviance and deviant behavior offer a more promising source of discerning information concerning elderly drinking. This is not to say, however, that gerontological perspectives serve as a "straw man" for making a case to apply deviance theories to understanding elderly drinking. On the contrary, these perspective offer complementary contributions to our understanding of the contextual conditions affecting elderly drinking which are beyond the scope of most of the mainstream deviance theories, including social learning theory.

Future Considerations

Despite the general decline in drinking with age, predictions concerning cohort effect, increased utilization, improvements in case finding techniques, and the sheer size of future elderly cohorts will undoubtedly result in an increased incidence of elderly drinking and subsequent problems. Even assuming that these cohort concerns do not contribute to increased rates of drinking problems in the elderly offers little solace. Considering the projected increases in our elderly population even a small proportion of elders experiencing alcohol problems will translate into enormous numbers. Furthermore, even a fortuitous decline in the rates of alcohol use with elders may not subdue the extent of the social problems we may face regarding elderly drinking in the U.S. One example of this can be seen in the National Drug and Alcoholism Treatment Unit Survey (NDATUS) reports of treatment provided to the aging segment of our population. Table 3 provides the proportions and numbers of older clients involved in substance abuse treatment from 1987 through 1992.¹ As can be seen from the table, the proportion of 55 to 64 year olds involved in treatment declined from 3.7% in 1987 to 3.2% in 1992. The proportions of those aged 65 or older declined from 1.1% in 1987 to .9% in 1992. However, the numbers associated with these proportions paint a quite different picture. The number of clients in treatment aged 55 to 64 rose from 21,592 in 1987 to 30,584 in 1992. Those

¹ This represents a single day census taken in September of each year.

Table 3: National Drug and Alcoholism Treatment Unit Survey. One-Day Census of Older Drug and Alcohol Clients. 1987-1992

Year	<u>55-64 years</u>		<u>65 years and over</u>	
	Percent	Number	Percent	Number
1987	3.7%	21,592	1.1%	6,569
1989	3.3%	22,335	1.1%	7,134
1990	3.4%	23,908	1.0%	7,214
1991	3.3%	24,293	1.0%	7,464
1992	3.2%	30,584	0.9%	8,954

Source: NDATUS, 1995

aged 65 and over increased from 6,734 in 1987 to 8,954 in 1992 (SAMHSA, 1995c). Even declines in the proportions of elders in treatment are overwhelmed by the shifting demographics of our population. While this is far from conclusive, as there are a number of factors that can affect this information, it does illustrate the potential magnitude of the problem we may be facing with regard to elderly drinking. The economic costs alone may be formidable considering that approximately 96% of those aged 65 and older are covered by Medicare programs (Adams et al., 1993) which cover the costs of most of these services. Not including treatment for drug and alcohol related physical problem, 1994 charges to Medicare for 98,568 hospital detoxification and rehabilitation admissions totaled \$737,224,688 (HCFA, 1995). This does not include charges for alcohol related liver disease, cardiomyopathy, gastritis, or neuropathy. Considering the continuing inflation of medical costs and the current political climate we are on the horizon of a social, political, and economic dilemma.

Unfortunately, we may not have to wait long to begin seeing the consequences of an aging society.

The information presented in this chapter only scratches the surface of the research which has been done on drinking behavior. With the exception of physics and perhaps certain branches of engineering, virtually all other scientific disciplines have either directly or indirectly focused some attention to the matter of alcohol and drug use. Although there remains considerable controversy in the literature, headway has been made in delineating the characteristics of elderly drinking. Regardless of the shortcomings found in the literature, the information that we have available to us provides a reasonably clear account of elderly drinking behavior. Population surveys, clinical studies, admission studies, case studies, and other methods of investigation give us a representation that, while not perfect, provides considerable insight concerning problems the elderly face and expectations for the future. However, there remains much room for advancement in our knowledge of the distinctive features of alcohol use by elders. There will be an increasing need for understanding the drinking habits of the elderly in the years to come, particularly those elders with drinking problems.

A number of questions emerge from the literature regarding areas which are in need of further development. Specifically, as noted by Dunham (1980), there is a critical need for changing our conceptions and measures of drinking patterns to include information concerning lifetime patterns of drinking behavior. While we do know that drinking decreases with age, there is some proportion of

the elderly who do not follow this pattern. Some portion of elders experience increases in health, social and psychological problems associated with increases in alcohol use. There continues to be a need for greater specification of the relationship between socio-economic factors and drinking, social psychological factors and drinking, and life-events and drinking. As indicated by the literature, can fluctuations and stability in drinking patterns across the life course be related to socio-economic status? Of those whose drinking patterns are more variable, do they have a greater likelihood of having increases in drinking with age? What is the nature of the relationship between social psychological factors, variations in drinking across the life course, and changes in drinking behavior among elders? Improvements in our measurement of drinking behavior, accounting for lifetime variation, coupled with relevant theoretical constructs and the influence of structural conditions has the potential to improve our ability to identify problem drinkers and increase our understanding of alcoholic drinking.

In the present study, it is assumed that these aggregated socio-economic, demographic, behavioral, social psychological influences, and the conceptual considerations outlined in the gerontological theories are subsumed in the social learning and past drinking factors. Collectively, these influences are construed to be either the direct or indirect cause of the factors of Definitions, Association, Reinforcement, and Past Drinking. These exogenous factors, in turn, yield the current drinking patterns we see in this sample of elders.

CHAPTER 3 THEORETICAL CONSIDERATIONS

Overview of Sociological Theories of Deviance

The application of theories of deviance to the drinking behavior of the elderly is not an unseasoned endeavor. Although most theories of deviance were initially formulated and empirically tested on adolescent and youthful populations (Akers, et al., 1988), arguments for applying deviance theories to the problem of elderly drinking emerged in the 1970s. Specifically, the functionalist roots of gerontological theory paved the way for an invitation by Peck (1979) to apply Hirschi's social control theory to the problem of elderly drinking. Peck's argument was later superseded by pronouncements that social control theory, strain theory, and social learning theory--constituting the most viable theories of deviance--all have a place in contributing to a theoretical understanding of the dynamics of elderly drinking behavior (Akers, La Greca, Sellers, 1988). There are several arguments for placing elderly drinking within the context of deviance theories. First, the basic principles of these theories are not considered to be age specific. Akers, La Greca, and Sellers offer the following justification for placing elderly deviance, specifically elderly drinking, within the framework of the major theories of deviance and crime.

The contention here is that special theories of elderly crime and deviance need not be invented to understand why some elderly

persons violate the law or social norms—one can draw upon extant perspectives. These theories are not necessarily age specific; they can be applied to the later end of the life cycle as they have been applied to account for the behavior at the adolescent or young adult stages. (Akers, La Greca, and Sellers, 1988, p.36)

Neither control theory's emphasis on social bonds to explain conformity, social learning theory's focus on socialization via the various learning processes, or strain theory's emphasis on discrepancies between socially approved goals and means, can be restricted to a specific age or point in the life course. Bonding, learning, and access to social resources are consequential from birth to death.

Second, by framing elderly drinking within the context of deviance theories, the problems inherent to approaching aging as a social problem and focus of study are curbed. As noted previously, much of the extant gerontological research tends to begin with an underlying focus on "growing old" as the problem. While there are unique characteristics associated with elderly drinking behavior, there are normative concerns regarding drinking at any age. It is unlikely that variables affecting drinking for elders would be grossly different than variables affecting drinking behavior in youngsters. Drinking by underage adolescents is legally and socially deviant and the theoretical models developed to account for teenage drinking across the spectrum from light to heavy have been successfully drawn from deviance theories. Only some elderly drinking is deviant, but the same general models should apply for all types of drinking

behavior. Moreover, social learning theory specifically claims to account for both conforming and deviant behavior.

Third, the historical emphasis on applying deviance theories to the drinking behavior of adolescents and younger adults has considerable theoretical continuity. While not immediately obvious, there are numerous similarities between adolescents and older adults regarding social status and attendant roles. Both adolescents and the elderly tend to experience:

1. exemption from work responsibilities;
2. relatively unstructured time schedules;
3. relative freedom from future life planning;
4. low prestige of status position;
5. limited financial independence;
6. relative freedom from family responsibilities;
7. de-emphasis on production and emphasis on consumption;
7. emphasis on play and leisure as a way of life (Feinberg, 1984:46).

Neither group is considered representative of mainstream society.

Furthermore, notable similarities regarding psychological development have been specified. Frissell (1992) notes similar developmental concerns for both youngsters and elders related to paradoxical cultural expectations for simultaneous self-reliance and compliance. With both groups there are expectation for independence, autonomy, and self-reliance which are only confounded by heightened dependence on family members or social networks. Culturally, both are considered "vulnerable groups [requiring] recognized caretakers" (Frissell, 1992:3). The experiences of the elderly are therefore characterized by various passages related to role disengagement, role transition,

and role acquisition (Feinberg, 1984:49) which, while contextually different for adolescents, are nevertheless bound to socialization processes.

Despite the similarities in the form of the socialization processes occurring with both elders and youngsters, there are some notable differences which warrant consideration. As described by Feinberg:

1. Juveniles can anticipate future engagement in economic, familial, and political roles; the elderly can anticipate mainly disengagement from such roles.
2. Juveniles expect and are expected to enter mainstream society; the elderly expect and are expected to leave mainstream society--and not return.
3. In time, the status, financial, and power positions of juveniles become stronger, whereas in time they become weaker for the elderly.
4. Juveniles look up to those currently in power for acceptance and their reference groups rest with the ongoing social order. The elderly are outside mainstream society, like the youth, but above it. Career concerns, the need to postpone gratification in anticipation of long-range goals, the myriad benefits of acquisitional behavior, the lure of certain status passages, and similarly societally tauted (sic) ideals which functions as the proverbial "carrot" leading society's members along prescribed routes have lost their motivational appeal, stripped as they are of their relevance, intrinsic value, and even their pretense by experience and the cool wind of objective reality.
5. Juveniles tend to have close and intimate role models to follow; the elderly tend to lack such idealized role models (Feinberg, 1984: 46-48).

The scope of the deviance theories is generally sufficient to accommodate the contextual differences related to age and still retain the constitutive form of the theory intact. Both the similarities and differences between elders and youngsters are important considerations in developing comprehensive sociological theories of drinking behavior. However, learning, behavioral acquisition, maintenance, and change do not end with the advent of adulthood.

The three dominant sociological theories of deviant behavior--social control theory, social learning theory, and anomie theory--have been examined

concerning their potential for understanding the drinking behavior of elders (see especially Akers, La Greca, Sellers, 1988). Effort to provide empirical support for anomie theory has been limited, at best, in examining delinquency and therefore never extensively adapted for application to elderly drinking (Akers, La Greca, Sellers, 1988:50). Peck (1979) outlined one of the first arguments for modifying Hirschi's social control theory to account for elderly drinking. Sellers (1987) provides the only bona fide test of Hirschi's social control theory applied to elderly drinking behavior. Her efforts showed moderate support for the social control variables, explaining approximately 27% of the variance related to alcohol use by the elderly. This was similar to results seen when social control theory has been applied to adolescent drug use and delinquency (Sellers, 1987; Akers, La Greca, Sellers, 1988).

Of these approaches, social learning theory has become securely established as one of the most comprehensive and empirically supported approaches currently available to social scientists for explaining deviant behavior. In studies comparing deviance theories, social learning theory has been acknowledged as a formidable model for explaining deviant behavior (Conger, 1976; Elliot, et al, 1985; Raskin-White, et al, 1982; Akers and Cochran, 1985; Benda, 1994).

Essentially two approaches have been employed in applying social learning theory to deviant behavior. The first approach is represented in Deviant Behavior (Akers, 1985). This approach is somewhat exceptional in that Akers

exemplifies the flexibility of social learning theory by applying it to a wide range of deviant and crime behaviors. It is an analysis of substantive issues of deviance framed in the language of social learning theory. This analytical approach employs a wide variety of data to identify reinforcement patterns (social and non-social), the use of neutralizing definitions, patterns of association, and the specification of *typical* learning processes that result in deviant or conventional behavior. Information on group rates, trends, and public policy are used to illuminate the essential components of social learning theory.

The second complementary approach employs more conventional, quantitative methods in pursuing empirical support for the theory. The empirical research testing social learning variables has proved quite productive. Considerable support has been accumulated for social learning theory in research on adolescent deviant behavior (Akers, et al, 1979; Akers and Cochran., 1985; Krohn, et al, 1985; Lanza-Kaduce, et al, 1984). Additional support for social learning theory explanations of adolescent alcohol and marijuana use has been observed even in light of mediating differences associated with the contextual setting of different communities (Krohn, et al, 1984) and age (Akers and Lee, 1996). Although various aspects of social learning theory have been supported empirically (for a discussion of this see Akers, 1985; Akers et al., 1979; Krohn, et al., 1985; Radosevich et al., 1980; Akers, et al., 1988), three major projects have focused on empirical support for social learning theory *in toto*. These projects (the Boy's Town study/1976-77, the

Iowa teenage tobacco use study/1980-84 and, the Florida elderly drinking project/1983-87) have provided clear empirical support for social learning theory (Akers, et al. 1979; Akers and La Greca, 1991; Akers, et al. 1989, Akers, 1985).

Social learning theory also has a solid track record in research on elderly drinking. Akers, La Greca, and Sellers (1988) used the social learning model and were subsequently able to explain about 59 percent of the variance in elderly drinking patterns. Akers and La Greca (1991) used social learning variables to show the effects of the situational context of elderly communities and alcohol use and accordingly offered support for social learning variables and their effect on drinking behavior.

Social Learning Theory and its Application to Elderly Drinking Behavior

The label "social learning theory" has been applied to a number of behavioral models (Akers, et al, 1988). The particular brand of social learning theory addressed here originated with Sutherland's theory of differential association. This form of social learning theory was not intended to supplant Sutherland's original theory. Rather, it is a reformulation of differential association theory by Burgess and Akers (1966) to edify the behavioral quality of the learning process (Akers, 1985:40-41). As such, the historical development of the Burgess-Akers approach is instructive in understanding the current form of the theory.

Edwin Sutherland introduced the first formal statement of differential association theory in 1939. His effort is considered a response to the severe criticism offered in 1933 by Michael and Adler concerning the state of criminological theory and research (Vold and Bernard, 1986, and Martin, et. al., 1990). Differential association began as a "tentative explanation" (Martin, et al. 1990, p.155) of criminality and has emerged as one "of a small number of important perspectives in the field [of deviance]" (Goode, 1990, p.46) and "one of the most influential statements in criminological history on the causes of crime" (Lilly, et al. 1989, p.57). Influenced by the sociological work being done at the University of Chicago, Sutherland is considered to have attempted an extension, formalization, and integration of the intellectual tradition that started with the works of Shaw and McKay, W.I. Thomas and G. H. Meade, and Louis Wirth and Thorsten Sellin. Sutherland was "convinced that the social organization--the context in which individuals are embedded--regulates criminal behavior" (Lilly, et al., 1989, p.56). The introduction of differential association theory marked a shift in criminological thought by rejecting the focus on mental illness, individual abnormalities, and various pathologies as the causes deviant/criminal behavior. Instead, Sutherland argued that criminal behavior is learned. Furthermore it is learned in the same normal fashion that all other behavior is learned (Goode, 1990). In the final formulation of differential association, Sutherland assembled nine propositions to outline his theory. They are as follows:

1. Criminal behavior is learned.

2. Criminal behavior is learned in interaction with other persons in a process of communication.
3. The principle part of the learning of criminal behavior occurs within intimate personal groups.
4. When criminal behavior is learned, the learning includes (a) techniques of committing the crime, which are sometimes very complicated, sometimes very simple; (b) the specific direction of motives, drives, rationalizations, and attitudes.
5. The specific direction of motives and drives is learned from definitions of the legal codes as favorable or unfavorable.
6. A person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law.
7. Differential associations may vary in frequency, duration, priority, and intensity.
8. The process of learning criminal behavior by association with criminal and anti-criminal patterns involves all of the mechanisms that are involved in any other learning.
9. While criminal behavior is an expression of general needs and values, it is not explained by those general needs and values since non-criminal behavior is an expression of the same needs and values (Sutherland, 1947, in Farrell and Swigert, 1988).

The gist of the theory is found in propositions 3-7 (Liska, 1987) with the overarching "principle of differential association" found in Proposition 6. The emphasis is on the nature of the interaction between individuals and the groups they participate in. This relationship is mediated by the normative values embraced by the social environment. The preference and balance of the normative values espoused by various group affiliations determines individual orientations to conforming or deviant behavior. Vold and Bernard specify two basic elements of Sutherland's theory.

The first element is the *content* of what is learned. This includes specific techniques for committing crimes; appropriate motives, drives, rationalization, and attitudes; and more general "definitions favorable to law violation." The second element of Sutherland's theory identifies the *process* by which the learning takes place.

Learning is said to occur through association in intimate personal groups. (Vold and Bernard, 1986, p.211)

Sutherland's treatment of the issue of *content* is consistent with the work of George Herbert Mead. Simply stated, individuals can, and do, interpret various experiences in different ways. From these concrete experiences emerge "definitions" of their particular situation. These definitions, which are rooted in personal experience, become the underpinning for relatively permanent outlooks, attitudes, and views on life. The source of these definitions originate in the *process* of interaction with others. Drawing on the work of Louis Wirth and Shaw and McKay, Sutherland incorporated the notions of culture conflict (different groups having different normative expectations) and differential social organization (the presence of conflict, or disorganization, in a society) (Vold and Bernard, 1986; Martin, 1990). Sutherland recognized that different "meanings" and values held by various groups often come in conflict and that these conflicts can be observed in those groups that make up the social organization. However, despite the recognition of overarching influence of culture conflicts and differential social organization, Sutherland clearly stated the level of analysis addressed by differential association. Although differential association is considered to be subsumed within the framework of both culture conflict and differential social organization, "[i]t is not necessary, at this level of explanation, to explain why a person has the associations which he has" (Sutherland, 1947, in Farrell and Swigert, 1988, p. 301). Sutherland's introduction of the concepts

of conflict and disorganization were intended primarily to illuminate the process of learning criminal behavior (Williams and McShane, 1988; Martin, et al, 1990). It should be noted that this specification is critical in understanding the level of analysis intended by Sutherland in the application of differential association and the level of analysis of the present study. Specifically, the punctuation or emphasis of differential association is at the level of *interaction* between individuals and their social groups as they are located in larger social organizations and institutions.

Several efforts have been made to reformulate differential association theory (see Vold and Bernard, 1986; Liska, 1987; Thio, 1988; Traub and Little, 1975). However, the efforts of Burgess and Akers have proved to be the most focused and penetrating. Their critique of differential association focused on limitations in specifying the learning process which people go through to learn deviant/criminal or conventional behavior (Burgess and Akers, 1966). Their response to this criticism was to reformulate differential association by incorporating behavioral psychology concepts to delineate and specify the nature of interactions as they occur during the human developmental process. Specifically, their effort incorporated the concepts of modeling, reinforcement, and notions of discriminative stimulus to specify the learning processes. It is a reformulation of differential association which focuses on the nature of the relationship between individuals and their environment. Later renamed by Akers as social learning theory, it incorporates the concepts of learning theory or

behavioral psychology into the differential association model. Following Sutherland's style, social learning theory is outlined in a series of related propositions that incorporate behavioral principles with differential association.

The result is as follows:

1. Deviant behavior is learned according to the principles of operant conditioning.
2. Deviant behavior is learned both in nonsocial situations that are reinforcing or discriminating and through that social interaction in which the behavior of other persons is reinforcing or discriminating for such behavior.
3. The principal part of the learning of deviant behavior occurs in those groups which comprise or control the individual's major source of reinforcement.
4. The learning of deviant behavior, including specific techniques, attitudes, and avoidance procedures, is a function of the effective and available reinforcers and the existing reinforcement contingencies.
5. the specific class of behavior learned and its frequency of occurrence are a function of the effective and available reinforcers, and the deviant or non deviant direction of the norms, rules, and definitions which in the past have accompanied the reinforcement.
6. The probability that a person will commit deviant behavior is increased in the presence of normative statements, definitions, and verbalizations which, in the process of differential reinforcement of such behavior over conforming behavior, have acquired discriminative value.
7. The strength of deviant behavior is a direct function of the amount, frequency, and probability of its reinforcement. The modalities of association with deviant patterns are important insofar as they affect the source, amount, and scheduling of reinforcement. (Akers, 1985:41)

Although not fully specified in these seven statements, drawing on these principles results in four main independent variables which have been operationalized for research by Akers and his colleagues--differential association, differential reinforcement, definitions, and imitation. (see Akers, 1985, 1997, for detailed presentation of these variables).

Differential reinforcement refers primarily to the process of operant conditioning. Behavior is acquired, maintained and changed as the result of instrumental conditioning. That is, as individual are rewarded for displays of specific behaviors the likelihood of the recurrence of that behavior increases. As individual are punished for displays of specific behaviors, the likelihood of the recurrence of those behaviors decreases. These rewards or consequences can be either social or non-social. The assumption here is that individuals will tend to maximize the social and non-social rewards they can receive as they minimize the social and non-social costs associated with various behaviors. The schedule of these rewards and punishments, which is determined by the ecological circumstances, contributes to the acquisition, maintenance, and change of specific behaviors.

Imitation refers to the behavioral notion of modeling which may itself be rooted in operant conditioning. Not only do social groups provide various types of social reinforcement (i.e. schedules of acceptance and approval) and punishments (i.e. schedules of rebukes or criticisms), they also provide models for behavior. Particularly in the acquisition of new behavior, observations of others provide vicarious information concerning what types of behaviors tend to get reinforced or punished. That is, one need not necessarily have to engage in a behavior to know if it will be followed by some type of reinforcement or punishment. Particularly with novel behaviors, if one views another engaging in behaviors which are perceived as being socially or non-socially reinforced he or

she may be more apt to try the behavior for themselves. Behaviors which are perceived to be followed by some sort of punishment may be more likely to be avoided.

Definitions refers to the normative standards of right and wrong that can be applied to any given behavior. These normative definitions act as discriminative stimulus for individual behavior, this is, they become associated with reinforcement or punishment. Virtually any behavior can be defined in a positive, negative or indifferent sense. Through the process of interaction, one learns which behaviors are defined as good and appropriate and which are bad and inappropriate and these definitions are internalized into the personality of the individual. The more behaviors are defined as positive the greater the likelihood of the behavior occurring. In addition, the more indifferent or neutralizing the definitions associated with a given behavior, the more likely it is to occur. Negative definitions circumscribing the behavior as inappropriate tend to inhibit the occurrence of that behavior.

These predominantly behavioral processes occur simultaneously with the process of differential association. All behavior is learned in a social context. It is in the process of interactions with others that behavior is acquired, maintained, and changed. Acquiring various definitions concerning behavior, receiving reward and punishment for behavior, and observing social cues to imitate are all social processes. Individuals are exposed to others (i.e. family and friends) who establish the schedule of reinforcement and provide the cues and definitions for

the acquisition, maintenance, and change of one's own behavior. The more one associates with other who hold conventional definitions, engage in conventional behaviors, and offer reinforcement for conventional behavior, the more likely one is to engage in conventional behavior. The more the exposure to deviant attitudes, behaviors, and reinforcers, the more likely that deviant behavior will emerge. As noted by Akers,

“... variations in association with individual and groups are important in two ways. First, they provide the deviant or conforming definitions and models to which one is exposed. Second, they influence the amount, frequency, and probability of reinforcement for deviant or conforming behavior and verbalizations as well as the probability that the definitions will become discriminative for deviance. (1985: 52)

Behavior, whether deviant or conforming, is provoked by a wide range of behavioral conditioning reinforcers or punishers presented to the individual. This includes both operant conditioning and observational learning or modeling. Specific behaviors will tend to increase if rewards are given for that behavior (positive reinforcement) or if penalties are avoided by engaging in that particular behavior (negative reinforcement). Conversely, specific behaviors will decrease if penalties are incurred for certain behaviors (positive punishment) or rewards are lost as a result of particular behaviors (negative punishment). Behavior is differentially reinforced depending on the schedule of reinforcements associated with certain actions. Individuals may also learn vicariously by observing a role-model's behavior and the ensuing consequences, whether positive or negative. This imitation provides cues concerning consequences individuals can expect

should they elect to engage in that particular behavior or some other similar behavior. The schedule of reinforcers and punishers for particular behaviors and the opportunities for observational learning takes place in the social arena in which the individual participates. Consequently, all behavior is learned through participation in various social groups. Individuals associate, both directly and indirectly, with groups that model and define various behaviors as compliant or aberrant and supply the essential reinforcements for continuation or cessation of those behaviors. Social groups, whether primary, secondary, reference, familial, peer, or occupational, provide opportunities for the reinforcing or punishing of particular behaviors. Ordinarily, as individuals move through the developmental process, the arena of influence changes from the primary influence of the family relationships to greater influence by peer relationships, secondary group, and reference groups.

Emerging out of the behavioral influence of social relationships, individuals develop a catalog of definitions concerning what is right or wrong, appropriate or inappropriate. These definitions may be favorable or unfavorable to deviant behavior and may reflect general social norms of society or norms specific to a particular sub-group. These definitions become manifest in one's values, beliefs, and moral disposition.

The introduction of behavioral principles allows for increased specificity concerning the ongoing socialization processes which individuals are subjected to and participate in. The use of behavioral principles in characterizing human

action emphasizes the behavioral aspects of social activity. The focus on applying the concepts of reinforcement (positive and negative, social and nonsocial), operant behavior, and modeling provides clear parameters for framing human learning and behavior. However, these basic principles alone would not be sufficient to raise social learning theory out of the discipline of behavioral psychology. The elaboration of the model by emphasizing the concepts of normative standards (definitions) and discriminative stimulus principles (social cues) further exemplifies the subtle and infinitely varied nature of human interaction. It is this emphasis on discriminative stimulus as a social phenomenon coupled with general principles of operant behavior, the range of group affiliations, the probabilistic (rather than deterministic) acclivity, and the various types of reinforcements (both social and non-social) available to individuals that situates social learning theory within a symbolic interaction framework.

Social learning theory has as its central concept this emphasis on interaction. The emphasis is on the reciprocal nature of social exchanges that emerge during the course of human development. The application of behavioral principles in social learning theory is reminiscent of social exchange models emerging from the work of George Homans (Cook, et. al. in Ritzer, 1990). Consistent with social learning theory, social exchange theory focuses on the reward/cost ratio of exchanges that occur *between* actors. Specifically, summary comparisons can be made with social learning theory and dialectic exchange

models. Definitions and differential associations can be embellished by employing the notion of specific *context variables* addressing issues such as explicit and implicit negotiations, tangible and symbolic exchanges, degrees of individualism, various levels of commitment, and proportions of cost and reward. *Process variables* of communication styles (cognitive, resolving, reconciling, appealing, rejecting, and coercive) and gaming patterns (cooperation, innovation, trust/equity, joint profit, power) can be used to elaborate social learning variables of differential reinforcement and imitation. (see Scanzoni, et al., 1989, for a detailed analysis of context, process, and outcome variables)

In a broader theoretical context, Akers clearly places social learning theory within a general framework of symbolic interaction and offers the following outline of the limits and scope of social learning theory.

The theory is ... incapable of accounting for why anyone or anything is socially defined as undesirable. It is capable of accounting for the reactions of the one who is so stigmatized to the sanctions others apply to him. The theory does not say how or why the culture, structure, and social patterning of society sets up and implements certain sets and schedules of reaction to a given behavior and characteristics. It does say what the impact of these reaction will be on the individual and what the impact of his counteractions will be on others. (Akers, 1985, p.43)

The cause of the exogenous social learning factors used in the study, and outlined in Chapter Two, is beyond the scope of the theory. The emphasis is on the nature of the reciprocal interaction that occurs between individuals during the socialization process across the life course. The establishment of differential norms in various social groups is not denied, however, the development of those

norms is not a focus of social learning theory. This emphasis on interaction is consistent with Blumer's emphasis on the importance of interaction in human development. Blumer states:

The makeup of the individual, as well as elements of that makeup, comes under the influence of the developing interaction, being withheld at this point, suppressed at other, and revised at other.... [I]nteraction constitutes the group life, and that... *interaction must be viewed on its own terms* (italics added, Blumer, 1969, p. 112-113).

Cooley's term "looking-glass self" describes the process whereby people come to embrace the values, judgments and definitions of themselves and their environment as it is negotiated during the course of interactions with others (Cooley, 1902). The conceptualizations of significant other, plasticity, and primary group are reflected in the organization and punctuation of social learning theory.

Social learning theory emerges from the symbolic interaction perspective incorporating the tenets of behavioral psychology. This is consistent with Sutherland's original conceptualization of criminal behavior as a learned behavior. Social learning theory elaborates on the differential association model while retaining this emphasis on the interactional nature of socialization and reflects concepts inherent in symbolic interaction and social psychology; namely, that all behavior is learned during the processes of interaction regardless of whether this behavior is considered conventional or deviant. Therefore, social learning theory is not simply a theory of deviant behavior, although that has been

its focus, more accurately it is a general theory of the acquisition, maintenance, and change in behaviors that emerge in the social/cultural environment of the individual. Social learning theory focuses on the reciprocal processes that occur between individuals and their various group associations.

In its fullest conceptualization, it does not approach the level of parsimony intrinsic to other theories such as labeling, social bonding, or strain theory. Its scope, on the other hand, exceeds that of all these theories. There are many possible arrangements regarding four primary variables (differential association, differential reinforcement, imitation, and definitions), and the specific discriminative stimuli which can influence behavior may be unique for every individual. Social learning theory is not a "bumper sticker" explanation of social behavior. Rather, it is a complex, comprehensive theory outlining the parameters of socialization processes. However, when empirically valid models are constructed based on the four main concepts, the theory provides a parsimonious explanation that, with the same set of three or four main concepts, can account for a wide range of behavior. Social learning theory has proven promising in establishing a scholarly language for examining the infinite variations and dynamic quality of social activity. Despite the occasional criticisms, social learning theory will continue as one of the more enduring theories of deviant behavior and socialization.

This study is intended to be an extension of the efforts of Akers, La Greca, and their colleagues to; 1) examine the utility and limits of social

learning theory, and 2) further clarify the influence of socialization variables and structural conditions on the drinking behavior of the elderly. Akers and La Greca offered a specific statement, which is applicable in the present study, concerning the social learning theory explanation of elderly drinking as follows:

... [A]bstinence or drinking and the pattern of drinking the develops (light, moderate, or heavy) results from greater rewarding consequences, on balance, over aversive contingencies for that behavior (both social consequences and the effects of the alcohol), that is, from *differential reinforcement*. Further, one's definitions of, or attitudes toward, drinking are conducive to consumption of alcohol when, on balance, the positive and neutralizing definitions of drinking offset the negative. The greater the extent to which one associates with drinkers and persons who hold favorable attitudes toward drinking (*differential [association]*) and who provide drinking models to imitate than with abstainers and persons who hold negative attitudes toward drinking, the more likely one is to drink and to drink more frequently. Therefore, drinking of alcohol can be expected to the extent that one has been differentially associated with other drinkers, and that one defines drinking as more desirable than abstinence or, at least, as justified. (1991: 248-9)

With regard to the elderly population, certain considerations and adjustments are warranted concerning the investigation of the effects of the social learning variables on drinking behavior which are reflective of the specific context of an elderly sample. Akers, La Greca and Sellers (1988) have outlined the following considerations for applying social learning theory to elderly drinking. First, *differential reinforcement* is important at all phases of the life cycle. However, the context of the reinforcers changes for the elderly population. With younger cohorts, particularly adolescents, alcohol use is initiated as a strategy to attain participation in a particular social group and alcohol use has primarily

social rewards. The elderly are more likely to report alcohol use for the direct reinforcement associated with the effects of the alcohol that in turn leads to alcohol being used as a social lubricant. The relaxing effects of alcohol reinforces continued alcohol use as a "social facilitator" (Akers, et al. 1988:41). The difference between adolescents and the elderly is a matter of punctuation. The adolescent uses alcohol as an incidental vehicle to achieve the primary goal of social acceptance and to "fit in" and peers constitute the main social interaction related to drinking behavior. The elderly are more likely to use alcohol for other reasons as well as social acceptance. The relaxing effects of alcohol itself serves to enhance social interactions. Second, *differential associations* are different for the adolescents and the elderly. The elderly have a greater age range in terms of social contacts with spouses and family members, as well as acquaintances, in community, avocational, or other context. Third, the norms and *definitions* concerning alcohol use remain similar for all age groups in terms of defining drinking in negative, positive, or neutralizing terms. Fourth, modeling and *imitation* are generally more important in the acquisition of new behaviors. Although sound in principle, imitation does not appear to hold up as well empirically as the other variables. This was noted relatively early in the literature (Akers, et al. 1979) and virtually removed as an independent variable in the research on elderly drinking (Akers et al. 1988). However, this may largely be a matter of measurement and empirical specification. In some research where imitation has been differently measured, it has had greater impact on the

dependent variables (see Spear and Akers, 1988; Boeringer, et al. 1991). Akers and La Greca did not include it mainly because of its assumed irrelevance for the elderly and measurement problems. The assumption is made that since the elderly have typically well established repertoires of behavior, little attention need be paid to this aspect in the present study. Theoretically, the present investigation aims at examining the relationship between these independent factors of differential association, differential reinforcement, and definitions and the dependent factor of drinking behavior.

In coming years the issue of elderly alcohol problems will gain increasing attention as the elderly population swells with the aging of the "baby boomers." Social learning theory has shown promise in offering direction for understanding the dynamics of alcohol use in the elderly population and there is a need for longitudinal research focusing on theoretical issues associated with drinking behavior in elderly populations which is conspicuously absent in the literature. Thus far the social learning models have been tested with good results in cross-sectional analyses of elderly drinking. (See Akers & La Greca, 1991; Akers et. al., 1988.) It has not been examined longitudinally to test its effects on elderly drinking to find a basis for stability and change in drinking and abstinence beyond the steadfast effects of habit and inertia.

As previously discussed, the general research strategy employed in this investigation follows the approach used by Akers and La Greca (1991) in examining social learning theory and community context issues as they relate to

the drinking behavior of elders. Inherent to social learning theory is the assumption that social learning processes operate within a social structural context. Those cultural, structural, and contextual factors effect the extent, magnitude, influence, and operation of the social learning processes. The examination of the structural context of elderly drinking in which psychosocial processes operate has, to this point, rightly focused on socio-demographic variables of income, education, occupational prestige, race, gender, marital status, region, and religion (see Chapter Two). Also, as noted, Akers and La Greca have studied community context and elderly drinking.

Drawing on the work of Dunham (1983), this investigation extends and compliments the work of Akers and La Greca by looking at stability and change in individual patterns of drinking over a three year period during the elderly years within the context of the individual's history of drinking patterns prior to the elder years. Hopefully, further specification of the relationship between social learning theory, drinking history, and current drinking behavior will "continue the process of mapping the topography of drinking behavior by older adults" (Pittman and White, 1991: 219).

Consequently, several specific hypotheses are tested in this investigation. In general, it is predicted that there is very little change in recent drinking behavior across time with the elderly. Changes that do occur will most likely be in the direction of declining use. There will, however, be a small proportion of elderly who display either increases in drinking or variability in their current

drinking behavior over time. Any patterns of stability or change in current drinking behavior will be related to the overall lifetime pattern or history of drinking. Those individual who have a historically stable pattern of light or moderate drinking will have a stable rate of drinking as an elder or generally decrease their alcohol intake. Those who report higher rates of drinking or have more variability in their lifetime drinking behavior will have a greater likelihood of heavy or problem alcohol use.

The major hypothesis is that the myriad of causes that result in elderly drinking are captured by the social learning variables and subsumed within them. The stability (and change) of drinking behavior observed over the three years of the study will be a function of the stability (and change) in the values of the social learning variables that occurs during that same period which reflect the stability (and change) in the social context for the elderly during that time. Furthermore, the hypothesis is that the social learning variables will have this effect even when controlling for the drinking history at the beginning of the period and the previous year's drinking during that period.

This investigation extends the previous research on social learning theory and elderly drinking by further specifying the overall characteristics of elderly drinking. By incorporating information related to the lifetime patterns of drinking behavior there is the potential for improving not only our understanding of drinking among elders but also the factors related to drinking and problem drinking for other age groups as well. The specification of such links may have

implication not only for public policy, prevention, evaluation, and treatment programs but also our theoretical understanding of drug and alcohol use.

CHAPTER 4 METHODOLOGY

A General Overview of Longitudinal Research

Longitudinal research involves the repeated measurement of a subject or group over a specified period of time to exploit the opportunity to studying developmental changes or continuities which occur over time. (Deschenes, 1990:153). This approach has been applied in various areas of sociology including; crime and deviance, family sociology, education, and numerous other substantive areas. Deschenes (1990) outlines the major advantages of longitudinal research as follows:

- 1) It allows for the opening to study the progress of life event because it permits processes and causes of change between and within individuals to be classified.
- 2) It allows for the quantification of trends in human behavior in that it can be used to study developmental milestones and the history of events in the life course.
- 3) It allows for the identification of patterns of behavioral change.
- 4) It allows for the testing of developmental theories in the specification of causal processes and examination of the relationship of context, process and outcome variables over time.
- 5) It is useful in describing the sequence of life events.
- 6) It allows for the justification of particular intervention strategies to prevent personal and social problems.

Generally, longitudinal research is regarded as superior to cross-sectional research because it enables processes and causes of change within and between individuals to be identified. It tends to be best suited for the development of causal models because of the repeated measures which allow for the analysis of patterns of change or stability. The time ordering of events can be determined relatively accurately in prospective longitudinal studies and there is better control of extraneous variables because individuals act as their own control. Hence, changes between subjects as well as changes within subjects can be investigated by using longitudinal data.

Despite the advantages of longitudinal designs there are numerous difficulties associated with using them. Typically, they tend to be quite expensive and time consuming. Additional problems are noted with regard to instrumentation, maturation effects, and attrition of respondents, particularly in panel studies. As a result, the choice of longitudinal versus cross-sectional research design has been a growing topic of debate in the past decade, particularly in the area of crime and deviance. Longitudinal research has probably had no stronger critics than Gottfredson and Hirschi (Gottfredson and Hirschi, 1990,1987; Deschenes, 1990). Specifically, in presenting their self-control theory of crime, Gottfredson and Hirschi argue against the use of longitudinal research methods in studying crime and deviance. They cite numerous misconceptions associated with the social science fondness for using longitudinal research methods, particularly with regard to criminality. They note it

is popular in the criminological literature to claim that longitudinal methods are superior to cross-sectional approaches in determining causality. However, they argue that there is a mistaken belief that longitudinal studies are necessary for determining causality with regard to criminal behavior. They offer this guidance concerning the appropriate emphasis of research in crime and deviance:

The fact that crime is by all odds the major predictor of crime is central to our theory. It tells us that criminality (low self-control) is a unitary phenomenon that absorbs its causes such that it becomes, for all intents and purposes, *the* individual-level cause of crime. As a corollary, it tells us that the search for personality correlates of crime other than self-control is unlikely to bear fruit, that short-term institutional experiences (e.g., treatment programs, jobs, jail) are incapable of producing meaningful change in criminality. And, of course, it tells us that theories based on contrary assumptions are wrong. (Gottfredson & Hirschi, 1990:232)

Despite the criticisms offered by Gottfredson and Hirschi there is some evidence to suggest that the relationship between age and crime, and other forms of deviance, is not a constant and seemingly permanent condition. In addition, data obtained in cross-sectional studies is often markedly different than data obtained in longitudinal studies. (Deschenes, 1990:161). Nevertheless, the arguments presented by Gottfredson and Hirschi are compelling and require thoughtful attention. However, despite their position concerning longitudinal research, many sociologists, criminologists, and particularly clinical service providers are more developmentally oriented in their theoretical positions and less deterministic or reductionistic in their approach to social analysis (see Sampson and Laub, 1993). Emphasis on developmental processes requires not

only an understanding of the differences between people but also an understanding of how individuals change over time. Longitudinal studies offer a unique opportunity for investigations of this nature.

Longitudinal studies are not a panacea for the problems encountered in any type of social research. However, in the present study, the application of a longitudinal approach is quite appropriate. The basic focus of the present study is one of theory verification and refinement. The social learning variables cannot be considered constants like race or gender, although they may be and often are stable through some points of time, they are subject to change. Furthermore, as indicated by Dunham (1983), it is rather presumptuous to consider drinking behavior to be constant across the entire life course. The overall tasks of this investigation includes the identification of subtle changes and the stability of drinking behavior; examination of the relationship of the social context of drinking, social learning processes, and drinking outcomes that occur over time. Finally, the most significant distinction between cross-sectional studies and longitudinal studies is in the respondents acting as their own controls. Controlling for differences in responses does not have to be managed statistically and the subtleties associated with stability and change in behavior can be more clearly identified. Longitudinal studies offer unique and discerning information for accomplishing these tasks by providing information which is generally unavailable in cross-sectional studies.

Sample and Procedure

The present study draws upon data collected as part of the Alcohol and the Elderly Project conducted at the University of Florida from 1982-1987, Ronald L. Akers and Anthony J. La Greca, co-principal investigators. This project was funded by the National Institute on Alcohol Abuse and Alcoholism (#P50AA05793) to collect information concerning the drinking behavior of the elderly.

The data, for the present study, were drawn from a structured, closed-end interview of noninstitutionalized elders aged sixty or older living in an age heterogeneous community in Alachua County, Florida.² The data collection instrument consisted of 344 items exploring such topics as socio-economic status, alcohol use patterns, social relationships, health status, legal entanglements, and various ecological factors. Items designed as operational measures of social bonding theory, anomie theory, and social learning theory was also obtained. Typical interviews occurred in the respondent's home and lasted approximately one hour. These data were collected as part of the larger study in which 1,410 interviews were completed in the first year of the study, representing four different communities (two age homogeneous and two age-

² Portions of this section are drawn extensively from manuscripts developed by researchers at the University of Florida working on the NIAAA Elderly Drinking Project. Most notably are Akers, La Greca, and Sellers, 1988, and; Sellers, 1987. These documents provide information concerning the development of the data set and the operationalization of variables.

integrated communities). Financial constraints limited the second year to include only Alachua County, Florida and Pinellas County, Florida (N=326) and continued constraints limited the third year to only Alachua County, Florida.

The sample for this study was a probability sample drawn from the entire community using a random-digit telephone enumeration. This approach utilized all of the households in Alachua County with existing telephone services (estimated at 97%) excluding hospitals, nursing homes, institutions, government agencies, those with prohibitive impairments, and itinerants. In residences where there were more than one eligible participant, a single respondent was randomly selected using the Kish technique to insure an equal chance of selection for each potential respondent (Kish, 1965); 429 valid enumerations were made in Alachua County yielding 359 respondents for an 84% completion rate. The final completion rate was 82% for the first year due to the exclusion of seven additional respondents because of incomplete data or age ineligibility. This yielded a total of 352 elderly respondents operationally defined as men and women who were 60 years of age and older at the time of the first interview. Of the original 352 respondents, 49 respondents were lost due to death, relocation, or other reasons after the first year and 85 respondents were lost after the second year. This resulted in a final longitudinal panel of 218 respondents who were followed over the entire three year period on which the present analysis is conducted. This constitutes a 62% completion rate after three years, which is a good retention rate in this aged population. Evaluation of frequency distributions

and various cross-tabulations comparing those who were captured in all three years with those who dropped out of the study yielded no significant differences with regard to the dependent variables. For information purposes, the socio-demographic composition of the Alachua County respondents in the first year of the study is presented in Table 4.

The data set has specific items that appropriately measure the social learning factors of interest--differential association, differential reinforcement, and definitions; the historical patterns of drinking behavior; and frequency and quantity of drinking during the past year. The event of interest is whether or not there is any change in drinking behavior. These changes or events are considered to be discrete time measures since only three points in time are being measured and the exact time of any change is unknown. For the purposes of this study, any change in current drinking behavior is considered as a single event. It may prove appropriate to view any change as a repeated measure since repeated changes in drinking behavior could, at least potentially, occur once at the point of the second year measure and again at the third year measure. However, the overall goal is to estimate a statistical model describing changes or stability in drinking over the three year period. It should be noted that the focus of this study is not to establish criteria concerning what constitutes excessive or alcoholic drinking behavior. Rather, the focus is to evaluate any measurable changes in drinking behavior regardless of the rate of use of the respondents. However, the matter of normative standards regarding drinking

Table 4: Demographic Characteristics of Alachua County Sample.

<u>Characteristics</u>		
Sex	Male	45%
	Female	55%
Race	White	85%
	Non-white	15%
Education	Mean years	11.8
Income	Median monthly	\$800 - 899
Occupational Prestige	Mean score	58
Age Distribution	60-64	28%
	65-69	25%
	70-74	18%
	75+	29%
Married		75%
N = 352		

behavior cannot be ignored. While most alcohol use is considered non-problematic, there is a level of drinking that, by any standard, is problematic and harmful. Therefore the use of traditional quantity-frequency indexes provides a reasonable guide in describing and outlining normative standards regarding current drinking behavior. The format for establishing the measures of the dependent variables of alcohol use and the independent variables, to be presented later, is adapted from the work done by Akers, La Greca, and Sellers (1988).

Overview of Structural Equation Modeling

There are several approaches worth considering here for statistical analysis. As always, the decision for using a particular approach is determined by the specific research questions and the characteristics of the data to be analyzed. Traditionally, the use of OLS regression, log-linear models, and event history models been the principal fare of researchers focusing on analysis of panel data. (see Markus, 1979 and Allison, 1984 for an overview of these techniques)

However, one of the more important recent developments in social science research is the advent of a variety of statistical packages which are capable of testing models with unobserved or latent variables which will be referred to here as “factors”. This approach, referred to variously as latent variable analysis, structural equation modeling, and causal modeling with latent variables, is most typically referred to as a LISREL-type analysis which is associated with the **L**inear **S**tructural **REL**ations program developed by Jöreskog & Sörbom (1989). The statistical package used in the present study is the CALIS procedure in the SAS software package (SAS Institute Inc. 1989). This particular procedure is designed for structural equation modeling and allows for the development of a statistical model specifying various types of factors for analysis. The procedure combines path and factor analysis for estimating unknown parameters and analyzes linear structural relationships estimated from a covariance matrix. While this can be used in a “shot-gun” fashion it is best

used with (and almost requires) a well grounded theoretical orientation for specifying the structural model. The analysis yields path coefficients which are essentially *standardized partial regression coefficients*. They are *regression coefficients* in that they describe the extent of the influence of independent variables/factors on changes occurring in the dependent variables/factors. They are *partial* regression coefficients in that any change is estimated with all other variables/factors held constant. They are *standardized* because changes are measured in standard deviation units. (See Loehlin, 1992; Hatcher, 1994; Byrne, 1989 for detailed information on structural equation modeling.)

While a detailed description of structural equation modeling can be complex, the general premise is relatively simple and quite applicable to the analysis at hand. Theoretically, the independent measures of interest (variables) used in the present study are said to be caused by the social learning "factors"--differential association, differential reinforcement, and definitions. The "context" of the life-time pattern of drinking may, for the purposes of this discussion, also be treated as a factor. The measure of interest--current drinking--is also considered a factor. As factors they are not subject to direct observation but rather they are inferred from the way they influence the observed measures or responses to items on a questionnaire. "Variables" are the observed measures of the respondents, which in this case is the respondent's answers to the interview questionnaire (i.e. yearly drinking frequency, monthly drinking frequency, etc.), which are discussed in the next section. It is assumed that the

factors, defined as hypothetical ideal-type constructs not directly observed, cause the values which are observed in the variables, rather than vice versa. The statistical analysis includes evaluation of correlations between vectors accounting for structural relationships and measurement errors. This method allows for the separation of model specification/measurement error from material changes and estimates them separately and simultaneously using iterative procedures. The actual model consists of two distinct types of sub-models: 1) the *measurement model* which describes the link between variables and the underlying or latent factors they are intended to measure, including estimates of the residual paths for the variables; 2) the *structural model* which specifies the relationship between the factors specified in the model, including disturbance (error) terms for the factors. This approach requires that theoretically grounded distinctions be made between factors that are exogenous to the model (independent), factors that are endogenous to the model (dependent), and the relationship between those factors. A variety of maximum likelihood goodness-of-fit tests subsequently describe the fit of the model to the data (see Jöreskog and Sörbom, 1989; Loehlin, 1992; Byrne, 1989).

There is a two-fold advantage to structural equation modeling as it is applied to theory verification studies. First, structural equation modeling allows for the assessment of convergent validity (how well the variables load onto or "hang" together as indicators of a factor) and discriminant validity (whether or not the variables are loading unidimensionally on a single factor). If the

measurement model performs well, then there is support for the construct validity of the variables and hence supporting claims that you are actually studying the factors of interest. Second, analysis of variables generally assumes that those variables are measured without error and that they are wholly reliable indicators of underlying theoretical constructs. Such assumptions are fraught with difficulties, particularly in the social sciences. Structural equation modeling allows for the analysis of the error variance of the variables in defining the factors. This serves to separate the unique variance from the common variance and model those separately. With factor analysis, factors are extracted only for the common variance and the unique variance associated with that particular variable is discarded. Structural equation modeling recaptures this unique error variance and includes it in the statistical model and analysis.

The mechanics of this are slightly complex when compared to regression analysis. In the present study, the structural equation model is established by specifying the various social learning variables as indicators of the factors of differential association, differential reinforcement and definitions. These factors are themselves considered to be different dimensions of another overarching factor, namely, social learning processes (see Akers and La Greca, 1991 for more information) and, as such, are correlated with each other. The retrospective data, presented in the next section, relating to lifetime drinking patterns are established as indicators of another factor--past drinking. Collectively the factors of differential association, differential reinforcement,

definitions, and past drinking, for the first year only, constitutes the exogenous or independent variables. Current drinking behavior, as indicated by self-reported alcohol use, constitutes the dependent endogenous factor. The analysis consists of: 1) evaluating the fit or "loading" of the variables on the factors in the measurement model; 2) the testing and modification of a model which specifies theoretical predictions concerning the causal relationship between the factors--the structural model; and; 3) extending the model by specifying additional endogenous social learning and drinking factors for year two and year three. While the social learning factors are considered exogenous at year one, they are considered endogenous at years two and three. The social learning factors are not independent at years two and three as they are considered dependent on their corresponding factors for the previous year.

The process begins with the establishment of a theoretical model identifying the expected relationships among the variables which is discussed later in this chapter. This theoretical model is used for the specification of a measurement model and subsequent structural analysis. The initial analysis of the data begins with the establishment and evaluation of the *past drinking* variable, following Dunham's (1983) guidelines, to be included in subsequent data analysis. The next step is to establish an acceptable measurement model of the variables and a stable structural model specifying the causal influences of past drinking and social learning on current drinking for only year one of the survey. If the past drinking variable is appropriately constructed, it is expected

that there will be a rather firm relationship between past drinking and current drinking since one's past drinking behavior should predict current drinking behavior. The final step is the extension of the model across the three years of the study and the longitudinal analysis of the relationship between the social learning factors, past drinking, and current drinking (which will, at year three, constitute the final dependent factor complete with its own manifest variables), and changes and stability in drinking.

Measurement of Variables³

The following is essentially a description of the measures to be used in the analysis. These measures constitute the manifest or observed variables. The selection of the variables is a crucial step in structural equation analysis with latent factors. The variables which are used are considered indicators of the factors. Therefore, the selection of the variables is critical in establishing both the measurement and theoretical models. It is advantageous to begin with a number of variables which are considered redundant indicators of the factors of interest. Part of the task in the present analysis is to identify a parsimonious group of select variables which are satisfactory indicators of the factors with which they are associated. Considering the relatively small size of the sample, part of the criteria for selecting variables is to limit the number of variables that

³ The variables outlined here are adapted from an operational scheme developed by Akers, et al., 1989. See Appendix A for an outline of select variables, specific questions posed in the interviews, and response options.

are used in the analysis. Therefore, no more than two or three variables will be used as indicators for each factor which is consistent with the four community cross-sectional analysis done by Akers and La Greca (1991). Considering that the data will be evaluated over a three year period, the use of more than 30 variables (about ten per year) is approaching the upper limit of the number of variables which can be used with a sample of 218 respondents. Although all of the variables listed below will not be used, it is considered prudent to begin with a larger number of variables than needed and then isolate a parsimonious number of variables which are both operationally representative of the factor of interest and contribute to proper solutions of both the measurement and structural theoretical models.

In the rest of this section, the heading represents the factor of interest which is followed by a numbered list of variables and their description. Brackets denote the factor names and parenthesis denote variables names which will be used in the model and later discussions. A "1", "2", or "3" at the end of a variable name specifies the year in which the measure was obtained unless otherwise indicated. Special consideration will be given to those variables used by Akers and La Greca (shown in bold print) in their cross-sectional four-community analysis in an effort to maintain some consistency in the analysis. However, all of these variables will be given at least initial consideration for the data analysis.

Abstinence/Alcohol Use [DRINKING]

1. Past Year Frequency of Alcohol Consumption (YFREQUAL).

This is a self-report measure of how frequently the respondent drank alcohol during the past twelve months. Response options were; never, once or

twice, less than once a month, once a month, 2-3 times a month, 1-2 times a week, 3-4 times a week, nearly every day, and every day.

2. Past Year Frequency/Quantity Index of Alcohol Consumption (YFQINDX).

This index is constructed by cross-tabulating the yearly frequency variable with a quantity variable addressing how much one drank in a typical sitting during the past twelve months in which he or she had alcohol. The values of this index are adopted from Cahalan et al. (1967) and ordered from; abstinence (no alcohol use), light drinking (1-6 drinks consumed less than once a month to 1-2 drinks taken 1-2 times a week), moderate (from 7-12 drinks less than once a month to 1-2 drinks daily), heavy (from 6-11 drinks 1-2 times a week to 3-6 drinks daily, and excessive (12 or more drinks 1-2 times a week to 7 or more drinks daily).

3. Past Month Frequency of Alcohol Consumption (MFREQAL).

This is a self-report measure of how often the respondent drank alcohol during the past 30 days. Response options were; never, once, 2-3 times, once or twice a week, nearly every day, and every day.

4. Past Month Frequency/Quantity Index of Alcohol Consumption (MFQINDX).

This index is constructed by cross-tabulating the monthly frequency variable with a quantity variable addressing how much one drank in a typical sitting during the past 30 days in which he or she had alcohol. The values of this index are ordered from; abstinence (no alcohol use), light (4 drinks consumed one time in the last month to 2 drinks consumed 1-2 times a week), moderate (5-12 drinks consumed one time in the last month to 1-2 drinks daily), heavy (6-10 drinks consumed 1-2 times a week to 3-6 drinks daily), and excessive (11-12 drinks consumed 1-2 times a week to 7-12 drinks daily)

Lifetime Drinking Variables [PAST DRINKING]

All of the following variables are used in the construction of the Dunham scale previously discussed in Chapter Two. These are retrospective measure drawn from the respondent's recollection of their drinking at different ages. Two other measures were considered--Teenage Drinking (prior to age 18) and Elderly Drinking (after age 60). It was decided that Teenage Drinking was not representative of what are typically considered the drinking years and that

Elderly Drinking is best represented by drinking behavior reported in the variables constituting DRINKING.

1. Young Adult Drinking (YA_DRIN)

This is a single-item retrospective measure of drinking behavior from 18 to 29 years of age.

2. Adult Drinking (A_DRIN)

This is a single-item retrospective measure of drinking behavior from 30 to 49 years of age.

3. Older Adult Drinking (OA_DRIN)

This is a single-item retrospective measure of drinking behavior from 50 to 59 years of age.

Response options for these variables were; did not drink, drank a little, drank regularly, drank a lot.

The first step for inclusion of past drinking behavior required the construction of a scale developed following Dunham's (1983) criteria (see Chapter Two). The scale was constructed using the self-reported past drinking variables of Young Adult Drinking, Adult Drinking, and Older Adult Drinking. This covered the range of what is typically considered the drinking years. Initially, every possible variation of drinking (64 patterns) was identified and a frequency distribution was done on the entire year one four-community data set (N=1410) to determine the occurrence of possible patterns of past drinking behavior. One category--highly variable drinking history-- needed for the complete Dunham scale was null, which meant that Dunham's scale had to be modified. Dunham had proposed that a drinking history of highly variable fluctuations in consumption over time would produce tendencies toward heavy drinking. There

was no case of extreme variability observed with this data set. The Dunham scale was modified with this in mind and an ordered-categorical scale was developed yielding the distribution shown in Table 5 which constitutes the past drinking variable to be used in the present analysis.

Table 5: Distribution of Past Drinking Behavior Among the Elderly. (Modified Dunham Scale)

Lifelong abstainers	19.0
Lifelong light drinkers	53.0
Rise and fall	8.0
Rise and sustained	15.1
Late rising	5.0
N=218	

Social Learning Variables

The following variables are the operationalized questionnaire items representative of various aspects of Differential Reinforcement, Differential Associations, and Definitions which constitute the core theoretical constructs of social learning theory. The social learning variables which are related to one's spouse's drinking and attitudes about drinking, which Akers and La Greca used, were not considered practical for this sample due to a large number of missing values (>10%).

DEFINITIONS [DEFINITIONS]

1. **Balance of Positive-Negative Definitions (OWNDEF).**

A single-item measure of the degree to which the respondent's own attitudes, on balance, are approving or disapproving of alcohol.⁴

2. Neutralizing Definitions (NEUTDEF).

A three item measure of the extent to which the respondent believes that drinking is appropriate if it is "controlled", "makes a person happy", and "watches his or her diet" (Cronbach's $\alpha=.54$).⁵

3. Proscriptive Definitions-never approve of alcohol (PRONA).

A single item measure concerning whether or not the respondent approve of alcohol use in any amount.

4. Prescriptive Definitions (PREDEF).

A single item measure concerning approval of alcohol use under certain circumstances.

5. General Definitions-religion (RELIG)

A single item measure of importance of one's religious beliefs.

6. General Definitions-moral duty (DUTY)

A single item measure of one's sense of moral duty to obey the law.

DIFFERENTIAL ASSOCIATION [ASSOCIATIONS]

1. Family's Drinking Norms(FAMNORM).

A two-item measure of perceptions of the normative attitudes of one's adult children and other family members regarding drinking. (Cronbach's $\alpha=.76$).

2. Friends' Drinking Norms (FRINORM).

A three-item measure of perceptions of the normative attitudes of best friends, friends one frequently associates, and longest-time friends regarding drinking. (Cronbach's $\alpha=.93$).

3. Family Member's Drinking Frequency (FAMDRIN).

A two-item measure concerning the drinking behavior of one's children and other family members (Cronbach's $\alpha=.77$)

⁴ Comparisons of frequency distributions by categories for OWNDEF across the three years indicated anomalies in the original coding of this variable for year two. Examination of the answer sheets revealed that 15 cases had been miscoded and were corrected.

⁵ The Cronbach Alpha Coefficient is an index of scale reliability estimating the extent to which individual items that constitute a test correlate with one another.

4. **Best Friend's Drinking Frequency (FRIDRIN).**

A one-item measure concerning the drinking behavior of one's best friend.

5. **Proportion of Friends Who Are Drinkers (PRFDRIN).**

A three-item measure of the proportion of drinkers among one's best friends, longest-time friends, and most frequent associates (Cronbach's $\alpha=.97$).

DIFFERENTIAL REINFORCEMENT [REINFORCEMENT]

1. **Balance of Reinforcement for Drinking or Abstinence in Social Relationships (SOCREIN).**

A one-item measure concerning the effects of alcohol use on social relationships. Non-drinkers were asked about anticipated outcomes if they were to drink alcohol.

2. **Friends' Reaction to One's Drinking (FRIREAC).**

A single-item measures of actual (if drinker) or anticipated (if not a drinker) positive or negative reactions to one's drinking by close friends

3. **Family's Reaction to One's Drinking (FAMREAC).**

A two-item measure of actual (if drinker) or anticipated (if not a drinker) positive or negative reactions to one's drinking by adult children and other family members (Cronbach's $\alpha=.95$).

4. **Balance of Perceived Positive and Negative Physical Effects of Alcohol (PHYREIN).**

A single-item measure of whether the direct physical effects of alcohol were mainly positive, negative, or neutral. Non-drinkers were asked about anticipated effects.

5. **Overall Balance of Perceived Rewards-Costs of Drinking (REWCOST).**

An eight-item measure of the perceived benefits of drinking (Cronbach's $\alpha=.99$) balanced with an eight-item measure of the detrimental effects of drinking (Cronbach's $\alpha=.99$).

The values that result on these variables are indicative of the latent factors they are said to represent. They are, indirectly, the instruments for testing the previously stated hypotheses. These variables reflect the hypotheses in the following ways. Across time, the more one defines alcohol use in either positive or neutral ways on these manifest variables, the more one reports

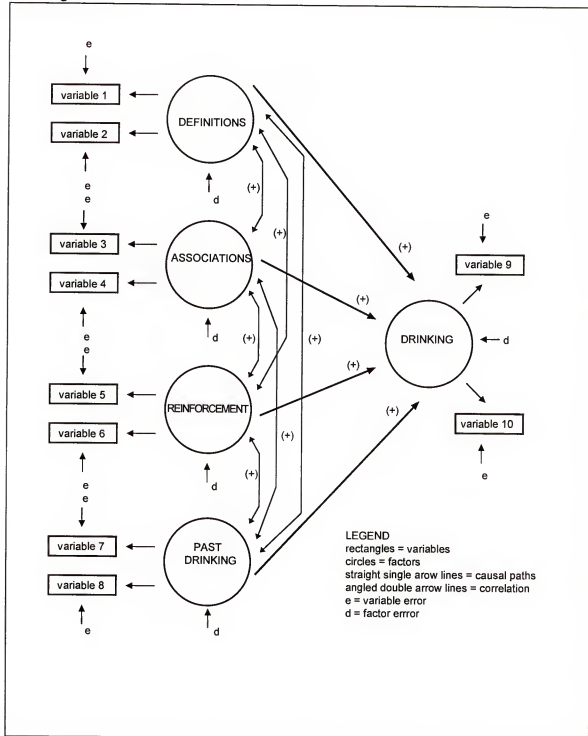
associations with drinkers, specifically family and friends, and the higher the perceived rewards and the lower the perceived consequences, the greater the likelihood of alcohol use. Those with a history of heavier alcohol use, as reported on lifetime drinking variables, in their drinking patterns will show a greater likelihood of alcohol use over the years of the study.

Specification of the Theoretical Models

As previously indicated, the initial step in structural equation modeling is the specification of a structural model identifying the hypothesized relationship between the variables and factors, relationship between the factors themselves, and the expected direction of those relationships. This working model is considered a graphic representation of the hypotheses being investigated.

Figure 1 is the graphic representation of the hypothetical model to be used in the present analysis and specifies the theoretical relationships posited by social learning theory. Initially, this model will be evaluated with regard to the data collected in the first year of the study for the Alachua County sample. The factors of DEFINITIONS, ASSOCIATIONS, REINFORCEMENT, PAST DRINKING, and DRINKING are shown in the circles. The variables used as indicators of those factors, as yet identified, are shown in the rectangles. As posited by social learning theory, DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT are expected to be correlated with each other which is specified in the model by the angled, double-arrow lines. In addition, it is expected that PAST DRINKING is also correlated with the exogenous social

Figure 1: Predicted Relationships Between Social Learning, Past Drinking, and Drinking Factors.



learning factors and is also specified in the model. Since these factors are considered exogenous to the model, they may be specified as correlated with each other. Factors and variables which are considered dependent on the model or endogenous may not be correlated with each other. These exogenous factors are expected to have a causal influence on DRINKING, which is specified by the straight single-arrow lines. The factors themselves are also said to be the cause of the responses seen with the variables, which is again identified by straight single-arrow lines. In this figure, the point of the straight single-arrow lines indicates that both the factor DRINKING and variables 1-10, are endogenous to the model (any item, whether factor or variable with a single-headed arrow pointing to it is, by definition, endogenous to the model), and therefore "dependent" on the model itself. In addition to the specification of the social learning factors as independent and exogenous, the error terms associated with the variables ("e") and the factors ("d") are also considered independent and exogenous to the model. As previously indicated, structural equation modeling recaptures the unique variance associated with the variables and includes this in the estimation of the model. This unique variance (error) is used to estimate error terms associated with the factors themselves and, in turn, used in the estimation of the complete measurement and structural model. The "+" sign indicates that the relationship between these factors is expected to be positive. The model in Figure 1 stipulates the hypotheses of the present analysis

by indicating how factors are expected to correlate with each other and the flow and direction of the causal effects.

It should be noted that this model is slightly different than the model used by Akers and La Greca in their cross-sectional four community analysis. Their model specified the factors of DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT as indicators of what is referred to as a second-order factor--SOCIAL LEARNING. This is theoretically appropriate as DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT are considered the operationalized constructs which exist under the umbrella of overarching social learning processes. This specification was necessary due to the high degree of correlation between DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT. An alternative approach is proposed in this analysis and specified in Figure 1. The double arrow angled lines indicate that the exogenous factors in the social learning process are expected to covary and explicitly specified in the structural equation model. This is also theoretically consistent with social learning theory and accomplishes two things. First, it does essentially the same thing a second-order factor does but yields a more parsimonious model because fewer unknown parameters have to be calculated and interpreted. Second, and perhaps more importantly, all of the parameters for the social learning factors can be estimated. One problem associated with structural equation modeling is the issue of *scale indeterminacy*. Factors are hypothetical constructs and, as such, have no established scale, or metric, and a scale must be established in order to interpret

the results. This is accomplished by fixing the scale of one, and only one, of the indicators variables at 1.0 which establishes the metric reference. (The variable selected for fixing at 1.0 is typically that variable which shows the highest loading in the measurement model.) This approach applies also to any factors which are used as indicators of, or said to cause, other factors. One factor must be fixed at 1.0 to solve the scale indeterminacy problem. The advantage of not including a specified second-order factor means that the path of one factor does not have to be fixed at 1.0 and, therefore, allows for the estimation of all of the parameters for those factors.

The task at hand is to establish a statistical model that is considered an appropriate empirical modeling of the data. The strategy for accomplishing this entails the identification of sound indicator variables and accurately specified path and correlated relationships. The verification of the adequacy of the indicator variables and the path relationships is typically accomplished through the use of various criteria measures and other information derived from the measurement and structural models.

Considering that factors are constructed from sets of correlated and redundant variables, the task is to isolate those variables which contribute significantly to the model and delete those variables which do not inform the model. The approach begins with developing a measurement model using all of the variables previously identified. The variables are recoded to yield ordered categories and to eliminate reverse coding. Missing cases are handled with

mean substitution as this will not affect the total variance for those variables.

This constitutes the initial form of the measurement model. Variables are then evaluated on a singular basis to determine their contribution to the measurement model. Part of the process requires the identification of impotent variables or factors which are deleted, one at a time, and then the modified model is run again to determine any improvement in the fit. Variables with only trivial contributions (changes of less than .0005 in the various fit indices discussed below) to the model are deleted until parsimonious measurement and structural models are achieved with each variable loading essentially on one, and only one, specific factor. This is accomplished by deleting those variable which prove unproductive due to low factor loadings, have tendencies to load on more than one factor, or are otherwise impotent or problematic. This process is accomplished in the development of the measurement model to insure that the manifest variables being used are actually measuring what they are intended to measure, loading appropriately onto the factors, and yielding a stable, good fitting measurement model. Once this is accomplished for the first year of the sample, the process is repeated for the year two and year three data separately to identify those variables which will load appropriately in the three independent models.

The accepted practice for doing this is to examine the factor loadings of the variables and review X^2 statistics and various goodness-of-fit indices (see Loehlin, 1992; Hatcher, 1994 for discussions of these indices). Technically, if all

the assumptions are met then the χ^2 statistic can be used to test the null hypothesis that the model fits the data. However, this statistic is sensitive to sample size and violations of normality. As a result, the χ^2 is typically evaluated relative to the degrees of freedom. The smaller the χ^2 value, relative to the degrees of freedom, the better the fit of the model. A Wheaton index is often used as an indicator of a good fitting model. This index indicates a good fit of the data to the model if the χ^2 value is no more than five times the degrees of freedom, however this is best considered as an arbitrary criterion.

Therefore, several goodness of fit indices have been developed which are considered superior to χ^2 tests in indicating the fit of the data to the model. These various goodness-of-fit indices are typically derived from comparisons made between the residuals in the observed covariance matrix and the residuals in the expected covariance matrix. The difference between these residual matrices is calculated yielding what is referred to as an asymptotically standardized residual matrix (SAS Institute Inc., 1989). The GOODNESS OF FIT INDEX (GFI), developed by Jöreskog and Sörbom (1989), is based on the squared values of the asymptotically standardized residual matrix. Bentler and Bonett's (1980) NORMED-FIT INDEX (NFI) is best considered as a percentage of observed covariation explained by a given measurement or structural model when compared to a "null-model" specifying all correlations as "zero" and usually applicable to large samples. Bentler and Bonett's NON-NORMED FIT INDEX (NNFI) (1980) and Bentler's COMPARATIVE FIT INDEX

(CFI) (1989) are variations of the NFI but provide information about the fit of the data to the model regardless of sample size, and generally considered the superior indices for evaluating the fit of a model. Values over .90 on all these indices are considered indicative of a good fitting model.

These goodness-of-fit scales are considered superior to χ^2 tests of significance as good fitting models can be achieved and still yield a significant χ^2 value. It is also considered prudent to directly review the distribution of the asymptotically standardized residual matrix. While the indices serve to guide the establishment of properly specified models and can verify the "fit" of the model, they may not be sensitive to asymmetry in the residual distribution. The use of several of these indices is warranted since no single index is considered to be a definitive indicator of a good fitting model.

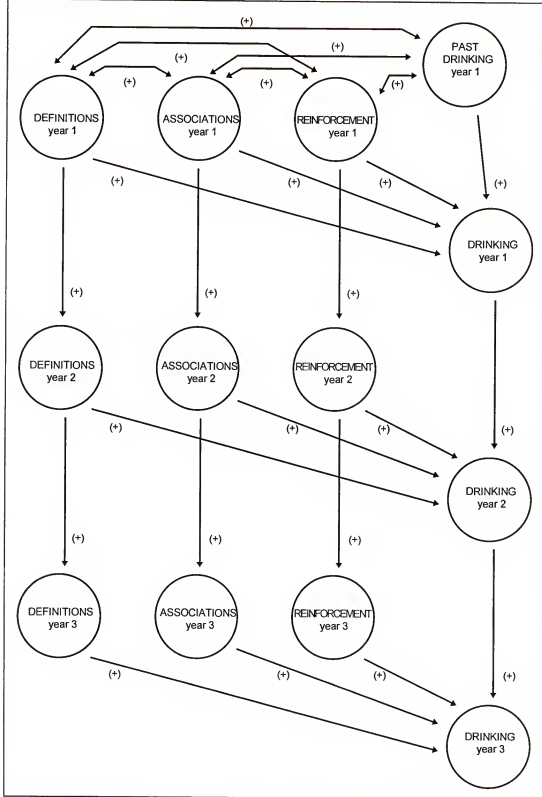
In addition to these, and other, fit indices, SAS's CALIS procedure also provides two types of modification indices which are used in detecting changes that may need to be made in the specification of the model. The Lagrange Multiplier Tests estimate the overall improvement in the model χ^2 if additional paths or correlations were to be specified in the model. Wald Tests serve the opposite function by identifying improvement in the model χ^2 if paths or correlations were deleted. SAS's CALIS procedure also provides error estimates for the factor loading for the variables allowing for t tests of the null hypothesis that the coefficients are equal to zero in the population. In addition, R^2 values of explained variance, based on *Squared Multiple Correlations* of antecedent

factors, is also provided. Collectively, the factor loadings of the variables, t-tests of significance for the variables and factors, the R^2 values of explained variance, the fit indices and the asymptotically standardized residual matrix, and the modification indices are evaluated with regard to theoretical consistency and adjustments are made until a stable model is achieved.

Figure 2 is a graphic representation of the model in Figure 1 extended over the three years of the study. The variables and the error terms are not explicitly identified in this model for simplicity. Once a stable first year model is established, the model is extended using the same variables measured at the second year and the third year and the same structural scheme. The model is generally read from the top-left or "upstream" to the bottom right or "downstream." *Antecedent* factors are those factors which are predicted to precede and have a causal effect on some downstream factor. *Consequent* factors are dependent upon upstream antecedent factors which are said to cause them. *Mediator* factors are those factors which convey or mediate the effects of antecedent factors onto a consequent factor.

The factors DEFINITIONS, ASSOCIATIONS, REINFORCEMENT, and PAST DRINKING specified at the year one are still considered exogenous because nothing within the model affects them. However, now there are more endogenous factors than DRINKING at year one. All of the social learning factors and DRINKING factors at year two and year three are also considered endogenous to the model. The cause of those factors is considered the result of

Figure 2: Hypothetical Longitudinal Structural Equation Model of Social Learning, Past Drinking, and Drinking Factors.



other factors which exist within the model. All of the social learning factors and the DRINKING factor at year two and year three are hypothesized to be causally influenced by factors specified within the model--social learning at year one.

DRINKING, DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT at year two would all be considered as mediator factors for year three of the study.

DRINKING at year three is considered the final dependent endogenous factor.

While this seems relatively straightforward, it does raise an issue regarding the specification of panel designs in structural equation models. Since the same respondent are answering to the same questions at three different time periods, it is obvious that there will be a relationship between subsequent responses. This relationship, which is referred to as *autocorrelation*, can yield biased results and which may be particularly apparent if the time between the measures is relatively short. If autocorrelation is not accounted for in the theoretical model, then statistics based on error estimates will contain repeated biases which result in errors that are actually dependent upon disturbances occurring in a previous year of the investigation (Markus, 1979). The solution to this problem is actually quite simple. If there is an expected correlation between the residuals for variables at year one, year two, and year three then those error variances for the variables at year one, year two, and year three must be specified in the theoretical model as dependent and allowed to covary. For instance, the error variance for the VARIABLE 1, as an indicator of DEFINITIONS, at year one need only be allowed to covary with the error

variances obtained for VARIABLE 1 at year two and year three. Error variances for VARIABLE 2, as the second indicator or DEFINITIONS, at year one are allowed to covary with the error variances for VARIABLE 2 at year two and year three, and so on. This is done for all the variable error variances (e) across the three years of the study. Unfortunately, this creates an additional problem in that any error variances specified as covarying, when in fact they do not, misspecifies the model and tends to corrupt the fit. The mechanics of resolving this dilemma involve establishing the initial model with all manifest error variances allowed to covary with their counterparts in subsequent years of the study. As indicated previously, SAS's CALIS procedure provides diagnostic indices for evaluating the contribution of both causal and correlated relationships specified in the model. Following the procedure outlined previously, covariance specifications regarding the error variances which are inappropriate specifications of autocorrelation are deleted, one at a time, and the model is run again to evaluate any improvement. This is done until the deletion of covariance specifications in the model results in only trivial improvement in the model.

As indicated in Figure 2, it is expected that the factors of DEFINITIONS, ASSOCIATIONS, REINFORCEMENT, and PAST DRINKING will be positively correlated with each other. It is generally expected that there will also be a positive relationship with both the exogenous and endogenous factors across time. Finally, there will be a positive relationship between the social learning factors and DRINKING as measured at year one with those same factors at year

two. The factors at year two will also be positively correlated with the year three factors. Figure 1 describes the predicted relationships between the factors of interest and specifies the theoretical structural model which will be used. Figure 2 describes that same model which is extended across the three years of the study.

CHAPTER 5 SOCIAL LEARNING AND THE STABILITY OF DRINKING PATTERNS

The Distribution of Drinking in the Sample

The data in Table 6 are the distribution of the frequency of self-reported elderly drinking for year three of the survey. This constitutes the final outcome measures in this investigation. Comparisons of drinking behavior for the sample at year one, year two, and year three showed virtually no differences in means, standard deviations or distribution for drinking behavior of the respondents during the course of the study (see Appendix B). Drinking behavior was essentially stable throughout the course of the data collection. As can be seen from the frequencies, a relative high percentage of respondents report no alcohol use in the last year of the study. Alachua county respondents reported the lowest rates of drinking of the four communities included in the total sample. For the total four community sample at year one (N=1410), 38.2% were abstainers, 19.6% were monthly drinkers, 21.1% were weekly drinkers, and 21.1% reported daily drinking (Sellers, 1987; Akers and La Greca, 1991).

Elders in Alachua County, Florida show a higher proportion of abstainers than seen in the other three communities and daily drinking is slightly higher than weekly drinking. This is consistent with information presented in Chapter Two. Considering the region and the more rural atmosphere, a higher proportion of

Table 6: Frequency of Past Year Drinking at Year Three for Alachua County Respondents.

Abstinent	58.8 %
Monthly (up to 2-3 times/month)	18.1
Weekly (up to 3-4 times/week)	10.4
Daily	13.1
N=218	

respondents would be expected to be abstainers when compared to more urban settings. It is interesting to note that the increase in the proportion of abstainers appears to come at the expense of the heavier drinking categories. This difference indicates one of the limitations of using this particular subset of the original larger data set. Assuming that the tendency toward higher proportions of abstainers is related to regional, religious, or socio-economic differences, then it is necessary to give some critical attention to the generalizability of the results. Fortunately, this does not present a serious problem with regard to this investigation.

The task at hand is to evaluate the influence of social learning variables with regard to drinking behavior. It is not to generalize the rate of consumption or its distribution by socio-economic variables to a larger population. Moreover, the structural influences of region, religion, socio-economic status, and

community structure are posited to be indirect through the social learning variables as demonstrated by Akers and La Greca (1991). If there are differences in the proportions of drinkers, then there will be a corresponding difference in the social learning variables. Social Learning theory posits that differences in drinking are related to the factors of DEFINITIONS,

ASSOCIATIONS, and REINFORCEMENT. The level of analysis addressed by social learning theory is that of interaction, not structural conditions per se.

Within certain limits, differences in proportions of drinking do not influence the mechanics of social learning assumptions. Should there be differences in drinking patterns across groups or changes in the drinking behavior of individuals across time, then those differences will mirror differences observed in the social learning variables. Since the matter at hand is the reciprocal interaction occurring between individuals and their social networks, then group or community differences in drinking patterns are quite tolerable.

Support for this expectation is shown in Table 7. In this table, path coefficients for the variables were estimated to compare different subsets of respondents available for the first two years of the study. Different sub-samples of respondents were delineated for specifying measurement and structural models to compare factor loadings of the variables for year one and year two. Those respondents available for year one and year two were used to specify models which might identify any notable difference in the variable loading. The first model shows the estimates for all of the respondents available at year one

Table 7: Factor Loadings for Manifest Variables on Two Year Longitudinal Samples Taken from the Elderly Drinking Project--Standardized Coefficients.

	<u>All</u>	<u>Sun City</u>	<u>Alachua Co.</u>
OWNDEF1	.81	.78	.80
PRONA1	.78	.73	.79
FRIDRIN1	.77	.78	.75
PRFDRIN1	.80	.77	.80
PHYREIN1	.79	.75	.87
REWCOST1	.82	.77	.86
YFREALC1	.95	.97	.95
MFREALC1	.99	.98	1.0
OWNDEF2	.80	.80	.90
PRONA2	.80	.77	.80
FRIDRIN2	.81	.73	.80
PRFDRIN2	.80	.77	.82
PHYREIN2	.83	.81	.87
REWCOST2	.89	.86	.94
YFREALC2	.98	.99	.89
MFREALC2	.90	.92	1.0
	(N=892)	(N=461)	(N=218)

and year two (N=892). The second model shows the path estimates for the Florida age homogeneous community--Sun City Center (N=461) for year one and year two. Model three shows the path estimates for the Alachua County sub-sample used in the present analysis but specified for only year one and year two. As can be seen, the path estimates are virtually equivalent with only slight differences observed between the sub-samples. The variables shown in Table 7 are the ones which were eventually used in the present analysis and discussed later in this section.

Differences between model one and model two ranged from .02 to .08 and averaged .0212. Differences between model one and model three ranged

from .01 to .12 and averaged .0412. This is considered to be well within an acceptable range and indicates that there are no gross differences between the coefficients for Alachua County alone compared to the whole sample or other communities. Alachua county is the sample of choice because there are three years of data available for it. This provides a smaller sample size, but seems to have no effect on substantive relationships between social learning and drinking variables.

Establishing the Standard Model

As indicated previously, once the hypothetical model (see Figure 1 and Figure 2) is specified, the task is to establish a stable measurement model to be used for examining structural relationships. The measurement model is intended to estimate how well particular variables serve as indicators of factors. This model can be viewed as the "standard" model for subsequent analysis as it assigns specific variables to factors and specifies either correlated or causal relationship. All of the variables described in Chapter Four were entered into a measurement model and evaluated regarding their factor loadings. The initial model, using all of the variables was, as expected, a very poor fitting model as indicated by the various goodness-of-fit indices (all below .76). Path loadings of the variables were examined and those variables with low or non-significant coefficients were deleted, one at time, until the fit indices became more acceptable. This was accomplished by running a series of measurement models

eventually identifying the variables to be used in the standard model (tables and figures not shown).

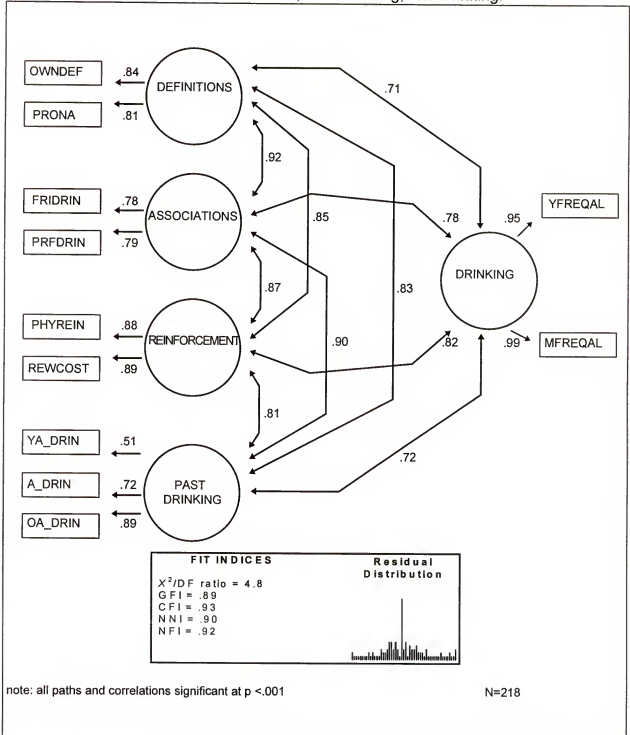
A number of variables seemed acceptable for inclusion in a standard model. For DEFINITIONS, the variables OWNDEF, NEUTDEF, PRONA and PREDEF warranted further investigation. For ASSOCIATIONS the variables of FRINORM, FRIDRIN, PRFDRIN proved to have high factor loadings. For REINFORCEMENT, FIREAC, PHYREIN, and REWCOST had the highest factor loading. All of the variables for DRINKING (YFREQUAL, MFREQUAL, YFQINDX, and MFQINDX) performed quite well. YFREQUAL and MFREQUAL performed slightly better than the scaled indices of YFQINDX and MFQINDX. Since Akers and La Greca had previously used yearly and monthly drinking frequency in their analysis, YFREQUAL and MFREQUAL were selected for inclusion in the standard model. (This proved, in the long run, to be a rather arbitrary decision. Structural models using YFQINDX and MFQINDX yielded results very similar to the model using YFREQUAL and MFREQUAL.) For PAST DRINKING, the variables YA_DRIN, A_DRIN, and OA_DRIN were selected for inclusion in the standard model. The modified Dunham scale, DRINDUN, was initially entered as a variable in a measurement model along with the other PAST DRINKING indicator variables but proved impotent in its contribution to the model. Subsequently, an alternative model was run where YA_DRIN, A_DRIN, and OA_DRIN were deleted from the model and DRINDUN was used singularly in both a *mixed* measurement and a *mixed* structural equation model (models

estimating correlations or causal path coefficients between both factors and variables). This effort proved fruitless as DRINDUN offered no significant contribution to either model. The intent was to use this scale as the measure of past drinking patterns to establish a lifetime "context" of past behavior within which to analyze the three consecutive years of reported drinking stability and change in this study. Given the ineffectiveness of the Dunham scale in the measurement and mixed structural model it was decided to utilize the less complex variables of YA_DRIN, A_DRIN, and OA_DRIN as variables for the standard model and indicators of one's history (or context) of PAST DRINKING.

Since the initial series of measurement model had established which variables were to be used for the factors DRINKING and PAST DRINKING, the next step was to establish the variables to be used for the social learning factors. Essentially, this was accomplished by generating another series of models using nearly every combination of the remaining variables for DEFINITIONS, ASSOCIATIONS, and REINFORCEMENT.

This was done and yielded the measurement model shown in Figure 3, which constitutes those variables to be used for the standard model in the present analysis. The counterparts of these variables for the subsequent years were also run in a single year model with similar results. More importantly, this shows that the selected variables will consistently work for the different years of the model and are therefore appropriate for specifying the longitudinal structural model. Generally, this model uses the same variables used by Akers and

Figure 3: Measurement Model of Variable Loadings and Factor Correlations for Definitions, Associations, Reinforcement, Past Drinking, and Drinking.



La Greca (1991) in their four community cross-sectional analysis. One variable which they had included, Spouse's Drinking Pattern, was not considered with this sub-sample due to a high number of missing values. All of the variables in their analysis and the ones intended here have strong face validity with close correspondence to the theoretical constructs they are measuring. The DEFINITIONS construct in the current analysis is indicated by one's own positive/negative definitions of drinking (OWNDEF) and one's proscriptive definitions-never approving of drinking (PRONA). The ASSOCIATION construct is indicated by the frequency of drinking of one's best friend (FRIDRIN) and the proportion of one's friends who are drinkers (PRFDRIN). The REINFORCEMENT construct is indicated by the balance of perceived positive and negative physical effects of alcohol (PHYREIN) and the overall balance of perceived rewards/costs of drinking (REWCOST). DRINKING is indicated by the past year's frequency of alcohol consumption (YFREQUAL) and the past month's frequency of alcohol consumption (MFREQUAL). Finally, PAST DRINKING is indicated by the pattern of abstinence and consumption of alcohol when the respondent was a young adult (YA_DRIN), a median aged adult (A_DRIN), and an older adult (OA_DRIN).

The measurement model in Figure 3 is not identical to the theoretical model shown in Figure 1 of the previous chapter, however, it is quite similar. The measurement model in Figure 3 can be viewed as a confirmatory factor analysis model which does not specify any causal relationship but simply allows

all of the factors to covary with each other. The purpose of this model is to determine how well the variables are loading on the factors they are associated with. The measurement model in Figure 3 was estimated using the maximum likelihood method. This is considered to be a good fitting model as indicated by several goodness-of-fit indices which are shown in the figure. The Goodness of Fit Index (GFI) was calculated at .89; Bentler's Comparative Fit Index (CFI) is .93; Bentler & Bonnett's (1980) Non-normed Index (NNI) was .90; and Bentler & Bonnett's (1980) Normed Fit Index (NFI) was .92. There was a normal distribution on the residuals with no obvious outliers. Although the χ^2 was significant at 168 with $df = 35$, the Wheaton Index was 4.8 which is considered within acceptable limits. As indicated previously, if all the assumptions are met then the χ^2 statistic can be used to test the null hypothesis that the model fits the data. However, this statistic is sensitive to sample size and violations of normality. Therefore, the χ^2 statistic is usually evaluated relative to the degrees of freedom. The smaller the χ^2 value, relative to the degrees of freedom, the better the fit of the model. The Lagrange Multiplier Index (χ^2 tests examining potential improvement in the model if additional paths are specified) show that there may be some improvement in the model if PHYREIN and REWCOST were used as indicator variables for the factor DRINKING. This would be conceptually inappropriate, but it does point to a strong relationship between REINFORCEMENT and DRINKING. It should be noted that an alternative model using different variables produced slightly better results, specifically, using

Proscriptive Definitions--Never Approve of Alcohol (PRONA) and Prescriptive Definitions--Approve Of Drinking On Special Occasions (PREDEF) as indicators of DEFINITIONS. However, OWNDEF and PRONA have the strongest bivariate correlations with drinking behavior (.63 and .58 respectively for YFREQUAL) and OWNDEF has been demonstrated to have a rather robust relationship with DRINKING in regression analysis (Akers, et al., 1989). Also, the measure of OWNDEF has a better conceptual fit with DEFINITIONS. In social learning theory the focus is on the balance of definitions favorable and unfavorable toward a given behavior. OWNDEF is measured by one's own extent of approval or disapproval of drinking behavior. Therefore, on conceptual and theoretical grounds the model with this variable, rather than Prescriptive Definitions (PREDEF), is more appropriate despite a slight reduction in the fit of the measurement model.

The SAS's CALIS procedure provides error estimates for the factor loading for the indicator variables which allows for t tests of the null hypothesis that the coefficients are equal to zero in the population. The t scores obtained for the variables in Figure 3 ranged from 7.7 to 20.8, indicating that all the factor loadings were significant ($p < .001$). This tends to support the convergent validity of the indicator variables (Anderson & Gerbing, 1988). In addition, reliability estimates were calculated for the variables and the factors. The indicator reliability estimate for any given variable is simply the square of the standardized factor loadings. These were calculated to be within an acceptable

range from .60 to 1.0 with exceptions noted for Young Adult Drinking (YA_DRIN) and Adult Drinking (A_DRIN). The indicator reliability estimate for the variable Young Adult Drinking (YA_DRIN) was calculated at .26 and Adult Drinking (A_DRIN) was estimated to be .51, which makes the reliability of these variables somewhat suspect.

However, when composite reliability was calculated for the latent variables the results were more promising. The composite reliability of the latent variables is calculated by dividing the sum of the reliability estimates for that manifest variables by that same sum plus the sum of the estimated error variances (calculated as one minus the indicator reliability). The composite reliability of the latent variables ranged from .76 to .97. This composite reliability estimate can be interpretable as a Cronbach Coefficient Alpha and is considered an adequate measure of internal consistency (Fornell & Larcker, 1981). Collectively, this indicates tentative support for the convergent validity and the reliability of the indicator variables used in the construction of the latent variables. Despite the concerns associated with the reliability of the manifest variables associated with PAST DRINKING, this form of the measurement model was tentatively accepted as the standard model for further analysis. One final adjustment was made in the theoretical structural model by removing the variable YA_DRIN and using only A_DRIN and OA_DRIN as indicators of Past Drinking. The rationale for this is the relatively low (.57) factor loading and the low indicator reliability (.26). The

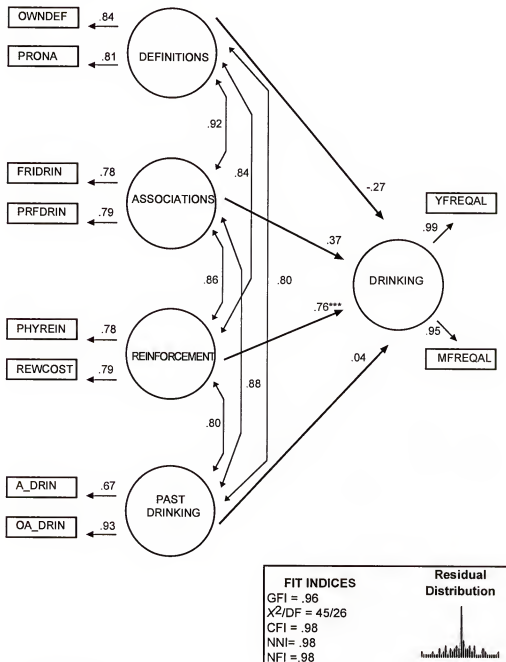
intent was to use only those variables which seemed to contribute to or inform the model.

The Structural Equation Model

In order to examine causal relationships in a structural model it is necessary that the variables used in the analysis serve as adequate indicators of the factors of interest. While the causal relationships which exist between the factors is of primary interest, it is necessary that the variables are suitable indicators of those factors. Failure to establish adequate indicators of the factors results in structural models which are dubious and therefore inadequate for hypothesis testing. The model in Figure 3 indicates that the indicator variables are adequate measures for testing causal relationships between factors. Using the variables specified in the measurement model, the next step is to remove the correlated relationships between the social learning factors and DRINKING, replacing them with causal paths, thus allowing for the testing of the hypotheses and causal relationships described in Figures 1 & 2.

Therefore, a structural model was estimated based on the measurement model specified in Figure 3. Figure 4 shows the standardized path coefficients for year one for the Alachua County respondents. This model specifies direct causal path from DEFINITIONS, ASSOCIATIONS, REINFORCEMENT, AND PAST DRINKING to DRINKING which is indicated by straight, single-arrow lines. The angled double-arrow lines indicate correlations among the social learning factors and PAST DRINKING. The fit indices show that this is a good fitting

Figure 4: Influence of Social Learning Factors and Past Drinking on Drinking.
Structural equation models with factor correlations, variable loadings and standardized regression coefficients.



model. The GFI = .96, the χ^2/DF ratio is 1.73, the CFI is .98, the NNI = .98, and the NFI = .98. There are no extreme outliers observed in the residual and the distribution appears normal. However, this model would have to be considered unacceptable model which has, perhaps, yielded an improper solution.

With a non-significant path coefficient of .04, PAST DRINKING does not appear to contribute to the explanatory power of the model. A number of alternative models were investigated to determine if any improvement could be made by respecifying the path relationships, all of which proved fruitless. However, while this may be viewed as a minor adjustment in specifying an acceptable structural model, it constitutes a significant finding regarding the original hypothesis of the present study.⁶

The failure of either PAST DRINKING or any of the past drinking variables to inform the theoretical model indicates that the utility of this context information in explaining current drinking is limited. Recall that the initial analysis of the drinking variables used to construct a composite past drinking scale (DRINDUN) showed that, contrary to Dunham's (1983) observation, high variability in past drinking behavior is either non-existent or occurs with such infrequency as to be inconsequential with regard to predicting elderly drinking. High variability in

⁶ One mixed model using only OA_DRIN did result in a significant relationship. Unfortunately, this came at the expense of the overall fit of the model. The GFI dropped to .91, the NNI dropped to .92, and the NFI was reduced to .94. This indicates that the factor of PAST DRINKING or even the lone indicator variable of OA_DRIN offers no significant contribution to the theoretical model and therefore, requires rejection of the model as it stands.

drinking behavior does not occur with this sample and therefore does not support the hypothesis put forth by Dunham. Dunham further argued that general information related to past drinking behavior is important to understanding one's current drinking behavior. However, the initial use of the PAST DRINKING variables (YA_DRIN, A_DRIN, and OA_DRIN) in the measurement model in Figure 3, shows that there is a decrease in the causal relationship between PAST DRINKING and its indicator variables with regard to the specified time periods. The tendency is that the further in the past any given drinking behavior occurs, the weaker it is in indicating PAST DRINKING and consequently the less influence it has on current drinking behavior. The factor loadings in the measurement model for YA_DRIN, A_DRIN, and OA_DRIN were .51, .72, and .89, respectively. Similar patterns are seen in the structural model in Figure 4 where the variable loadings are .67 for A_DRIN and .93 for OA_DRIN. This tends to indicate that the predictive power of one's past drinking on current drinking is mediated by the effects of time itself. Recall, that the overall pattern of elderly drinking behavior is that of stability with tendencies toward declining use. Furthermore, as argued by Skog (1991), declines in drinking with increasing age are more associated with social factors and the physiological impact of aging rather than any overarching cohort, selection effect, or contextual considerations. Additional support for this is seen in the overriding influence of the factor of REINFORCEMENT. The path coefficient for REINFORCEMENT shown in Figure 4 is .76 ($p < .001$). This indicates that social

learning in general and REINFORCEMENT in particular, specifically physical reinforcement and the balance of rewards and costs, has the strongest causal influence on current drinking behavior. This is consistent with social learning theory and assertions that reinforcement for drinking may be the over-riding predictor of elderly drinking (see Chapter Three).

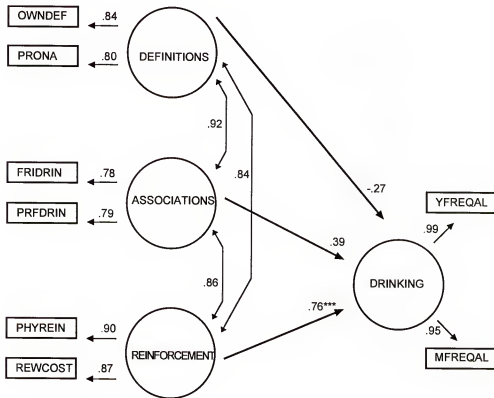
It would, however, be rather misleading to conclude that past drinking behavior does not have any influence on current drinking behavior. What may be more accurate to conclude is that there is a decreasing influence of past drinking behavior on current drinking as time passes. Drinking behavior as an adolescent or young adult may have only minimal causal influence on the current drinking behavior of elders, while drinking as an older adult may tend to have a greater causal influence. As such, if information concerning social learning is available, past drinking behavior offers no contribution to predictions made about current drinking behavior. In addition, there is support for the effects of contextual conditions being mediated by social learning. One of the questions posed in Chapter One was whether contextual influences are ordinarily indirect through social learning as demonstrated by Akers and La Greca (1991) or, if in fact, there are contextual influences which are not mediated by social learning. The decreasing relationship between past drinking and current drinking and the failure of the PAST DRINKING factor and its attendant variables tends to indicate that not only are the effects of structural conditions indirect through social learning (as shown by Akers and La Greca, 1991), but the effects of one's

personal drinking history is also indirect through social learning. This indicates that not only are contextual consideration of the *normative or cultural dimension* indirect through social learning but contextual influences related to the *social behavioral/interactional dimension* are also indirect through social learning (see Chapter One; Akers, 1996:242-243).

The information yielded from the standard measurement and structural model justified the deletion of the PAST DRINKING factor from the model. This modification is reflected in the model shown in Figure 5. The deletion of Past Drinking proved a reasonable solution considering that the path coefficients for the social learning constructs remained unchanged. Had PAST DRINKING offered any contribution to the overall model, beyond a correlation with other factors, one would expect noticeable changes in the path coefficients for other constructs. Additional support is also seen in Figure 5 concerning the mediating effects of social learning. Note that the only change seen in the factor loadings of the social learning variables is seen with the factor REINFORCEMENT. The variable loadings and the factor coefficients are virtually identical to those observed in Figure 4. This indicates that there is no influence beyond a correlational relationship regarding PAST DRINKING and the other factors. Furthermore, any causal effects associated with PAST DRINKING are reflected in REINFORCEMENT. Since no change is observed in the path coefficients for the social learning variables or R^2 values for DRINKING (.79 for both models), the deletion of PAST DRINKING is warranted.

Figure 5: Influence of Social Learning Factors on Drinking.

Structural equation models with factor correlations, variable loadings and standardized regression coefficients.

**FIT INDICES**

GFI = .96
 X2/DF ratio = 35/15
 CFI = .99
 NNI = .98
 NFI = .98

Residual Distribution

*** significant at $p < .001$

N=218

The path coefficient for DEFINITIONS in Figure 4 and 5 is non-significant and negative. While a positive relationship is predicted from social learning theory, a negative relationship between DEFINITIONS and DRINKING can be explained by the theory if it is balanced by the effects of ASSOCIATIONS and REINFORCEMENT. Akers and La Greca (1981) had shown that heavy drinkers in the four communities were more likely to report negative attitudes toward heavy drinking than the abstainers and moderate drinkers. This was offset, however, by the positive balance of rewards/costs attached to heavy drinking coupled with disproportionate associations with heavy drinkers. It was quite possible that such a phenomenon might be evident with this sub-sample. ASSOCIATION or REINFORCEMENT could be interacting with DEFINITIONS in such a way to produce a negative coefficient between DEFINITIONS and DRINKING despite the positive bivariate correlations between the indicators for DEFINITIONS and DRINKING. If this were the case, it would be reflected in tables controlling for either ASSOCIATIONS or REINFORCEMENT. This was not the case. The general pattern that emerged in frequency tables for OWNDEF and YFREQAL controlling for REWCOST and frequency tables for OWNDEF and YFREQAL controlling for PRFDRIN (tables not shown) is that the relationship between definitions and drinking remains positive for all values of reinforcement and associations. Thus the negative path coefficients in Figures 3 & 4 is an artifact of this structural equation model; they do not reflect a real difference in behavior. This indicates that one, or both, of two problems may

exist in the structural model. Either the model is misspecified or there is a high degree of multicollinearity among some of the variables. The problem here, unlike the problem with PAST DRINKING, is not a null, non-significant coefficient, but the direction.

Fortunately, this is not the first occurrence of path coefficient "going negative" unexpectedly or artificially and SAS's CALIS procedure provides, as do most other programs, options for handling such occurrence. Unfortunately, while the application of these procedures did yield models with a "good fit", asymmetry in the residual distributions was conspicuous. A series of models were run which did yield positive, significant relationships between DEFINITIONS and DRINKING with no overall change in path coefficients for ASSOCIATIONS and REINFORCEMENT. These models, however, violated theoretical assumptions concerning correlated relationships between the social learning factors or the direction of causal relationships. Again, while most of these model would yield acceptable fit indices, the residual distributions were clearly skewed or otherwise asymmetrical. One particular model did produce a relatively good fit. This model respecified the causal relationship between DEFINITIONS and DRINKING as coming *from* DRINKING and *going to* DEFINITIONS. This model specified that DRINKING causes DEFINITIONS. Unfortunately, while this relationship is quite intriguing because it point to possible reciprocal effects, it is not germane to the present study. The relationships of interest in the present study are effects of the social learning factors on drinking behavior, not the effects of drinking

behavior on social learning factors. Therefore, this does not solve the problem of the negative coefficient between DEFINITIONS and DRINKING. However, this indicates that not only is there reciprocity between the social learning factors but also between the social learning factors and DRINKING. What becomes apparent with these models is that a full and complete evaluation of the reciprocal relationships among the social learning factors themselves would involve the specification of numerous reciprocal or correlated relationships (See Akers and Lee, 1996) and probably more appropriately applied to the full four-community sample for year one. However, while a complete specification of relationships between social learning factors is beyond the scope of this study, necessity dictates at least a partial specification of these relationships.

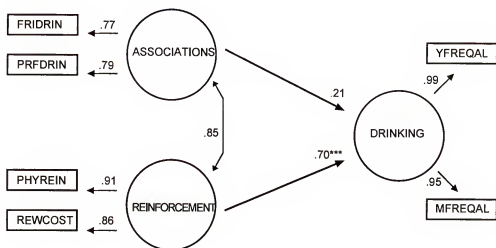
Although Akers, et al. (1989) had acknowledged that there were some colinearity effects in their cross-sectional analysis of the full sample of 1410, these effects were considered to be within acceptable limits. A regression model, including colinearity diagnostics, was run on the smaller sample of 218 used in the present study specifying the standard model variables. The results indicated a potential colinearity problem particularly with regard to OWNDEF for this sub-sample of the data. Review of the correlations between the variables and the factors tend to reflect the strength of those relationships and possible violations of assumptions concerning colinearity in the structural model. Therefore, one solution to this problem would be to delete the offending variables that corrupt the model producing the anomalous findings. Such a

model, shown in Figure 6, specifies ASSOCIATIONS and REINFORCEMENT as the sole exogenous factors. This model shows a good fit according to the various fit indices. The GFI is .97, the X^2/DF ratio is 3.28, CFI = .99, the NNI = .97, the NFI = .98, and there appear to be a normal, albeit slightly flat, distribution on the residuals.

While this may be considered a reasonable solution, it does not allow for the inclusion of DEFINITIONS which appears to be making some contribution to the overall model. Another, and more appropriate, approach is to systematically re-specify, adhering to structural equation modeling conventions, the model in such a way that the glut of common variance shared by highly correlated endogenous variables is mediated by other social learning factors. To this end, the model in Figure 6 was re-specified, again without DEFINITIONS, removing the correlation between ASSOCIATIONS and REINFORCEMENT and replacing it with a causal path yielding the model shown in Figure 7. Essentially, this model re-specifies the theoretical assumptions initially posited, in the present study, concerning the relationship between the social learning factors. Note, that the models to this point have specified only correlated relationships between the social learning variables. This model specifies a causal relationship between ASSOCIATIONS and REINFORCEMENT which is theoretically consistent with social learning theory as it is applicable to elders. Previous empirical and theoretical work has shown that differential reinforcement has a dominant influence on elderly drinking behavior (Akers and La Greca, 1991; Akers, et al.,

Figure 6: Influence of Associations and Reinforcement on Drinking.

Structural equation model with factor correlations, variable loadings and standardized regression coefficients.

**FIT INDICES**

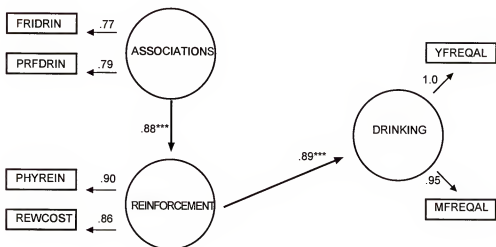
GFI = .97
 X2/DF ratio = 23/7
 CFI = .99
 NNI = .97
 NFI = .98

Residual Distribution

*** significant at $p < .001$

N=218

Figure 7: Influence of Associations, as Mediated by Reinforcement, on Drinking.
Structural equation model with variable loadings and standardized regression coefficients.



FIT INDICES

GFI = .96
X²/DF ratio = 26/8
CFI = .98
NNI = .97
NFI = .98

Residual Distribution



*** significant at $p < .001$

N=218

1988; Akers, et al., 1989). Therefore, such a modification is theoretically consistent and empirically supported. The fit indices for the model in Figure 7 are also quite good--GFI = .96, X^2/DF ratio = 3.25, CFI = .98, NNI = .97, and NFI = .98. However, the distribution on the residuals is quite skewed with problems noted with the indicator variables of REINFORCEMENT and DRINKING. Again, this is reflective of the strong relationship between REINFORCEMENT and DRINKING.

Since the model in Figure 7 showed promise despite a different configuration of the relationship between REINFORCEMENT and ASSOCIATIONS, the next step was to evaluate a similar model which also included DEFINITIONS. This was accomplished by specifying a causal path between DEFINITIONS and REINFORCEMENT and specifying a correlation between DEFINITIONS and ASSOCIATIONS, yielding the model shown in Figure 8. The fit indices for this model were slightly better than the model in Figure 7--GFI = .96, X^2/DF ratio = 2.2, CFI = .98, NNI = .98, NFI = .98, and there is a normal distribution on the residual. What is notable about this model is that there is no change noted in the path coefficient from REINFORCEMENT to DRINKING or its significance and the path from DEFINITIONS to a downstream factor is now positive rather than negative. The correlation between DEFINITIONS and ASSOCIATIONS is the same as that seen in all previous structural models with these variables (.92). In addition, what this model serves to do is isolate the multicollinearity effects of the variables for DEFINITIONS,

particularly OWNDEF, upstream in the model. This forces the correlated effects of DEFINITIONS and ASSOCIATIONS to be mediated by REINFORCEMENT onto DRINKING and more accurately specifies the relationship between the social learning factors. In effect, whatever "noise" is generated by the multicollinearity effects of the DEFINITIONS indicators with the ASSOCIATION indicators is mediated by their specified correlation and their causal influence on REINFORCEMENT. In this case, specifically with this elderly sample, it is REINFORCEMENT which tends to "soak up" the effects of DEFINITIONS and ASSOCIATIONS and acts as a mediator factor which is the most influential determinant of drinking behavior. This is consistent with the results obtained by Akers and La Greca (1991) in their model with the full four-community sample.

Theoretically, this indicates that some of the original assumptions, in the present analysis, which were based on the correlated relationships between social learning factors are flawed. It is more theoretically consistent, and empirically supported here, that while there may be correlated relationships between social learning factors, there may be causal relationships which, if specified, yield superior models. In this case, the specification of causal relationships between social learning factors yields an improvement over models previously specified with this sample or the full, four-community sample.

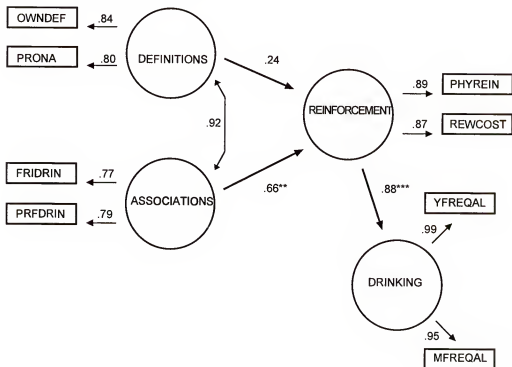
It is important to note that this does not in any way constitute a complete specification of the relationship between the social learning factors. As indicated previously, such an analysis would need to be performed on the full data set of

all four communities beginning with the specification of reciprocal effects between all of the social learning variables and including some dependent variable of interest. The task in this analysis is to identify a stable model which yields consistent results with no anomalous coefficients that leads to a suitable model for demonstrating the effects of social leaning on drinking over time. The model in Figure 8 appears to be the best for this and suitable for the longitudinal model. For REINFORCEMENT the R^2 value is .783 and the R^2 value for DRINKING is .779. A high proportion of the variance of REINFORCEMENT is explained by DEFINITIONS and ASSOCIATIONS, which, in turn, explains a high proportion of the variance of DRINKING. The R^2 value for DRINKING is virtually identical to the R^2 values seen in Models 4-7 (.789, .788, .781, and .790, respectively), which is only slightly higher than the $R^2 = .75$ achieved by Akers and La Greca (1991). This indicates that the retention of all of the social learning factors in the model, in this configuration, is reasonable. It is theoretically consistent and allows for more information related to social learning and elderly drinking to be included for analysis.

Figure 8 displays the final standard theoretical model used in this investigation which was subsequently extended through the three years of data. DEFINITIONS and ASSOCIATIONS are shown to be highly correlated with each other (.92) which is indicative of the strong relationship between these factors. It is possible, and indeed probable, that there is a reciprocal relationship existing between these factors. There can be a number of unspecified influences or

Figure 8: Influence of Definitions and Associations, as Mediated by Reinforcement, on Drinking.

Structural equation model with variable loadings, factor correlations, and standardized regression coefficients.



FIT INDICES

GFI = .96
 X2/DF ratio = 38/17
 CFI = .98
 NNI = .98
 NFI = .98

Residual Distribution



** significant at $p < .01$

*** significant at $p < .001$

N=218

factors which are unknown and unspecified and therefore subsumed within these social learning factors. As shown previously, PAST DRINKING appears to be subsumed by the social learning factors. The previous work of Akers and La Greca (1991) indicated that community context factors are also subsumed by these factors. No doubt other factors, such as religion, generational effects, period effects, and parental influences are also being reflected in DEFINITIONS and ASSOCIATIONS. Unfortunately, all of those contextual consideration are beyond the scope of social learning theory and therefore technically unknown and external to the model in Figure 8 . However, some speculation may be appropriate considering the strength of this correlation. It seems reasonable to assume that one's past drinking experience, religious orientation, and period and generational effects are reflected, to some degree, in how drinking behavior is defined for that person. It is also reasonable to expect that one's association with their community and social network of friends and relatives would contribute to emergent drinking patterns.

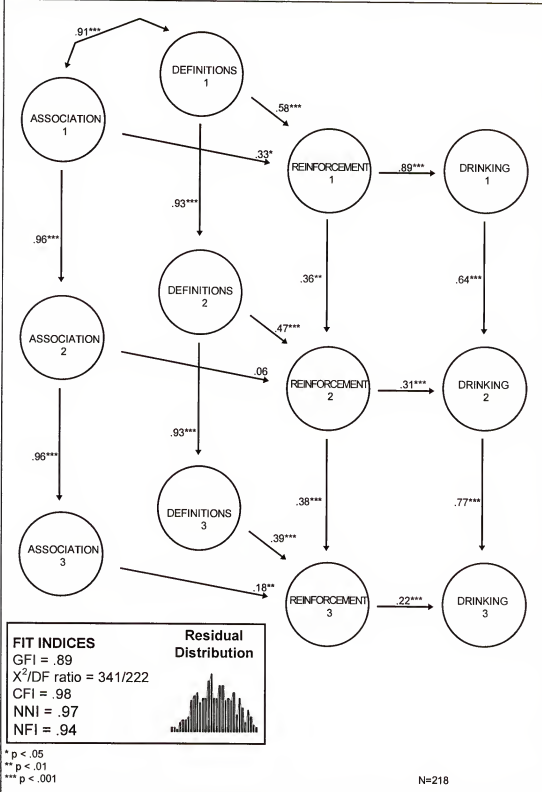
This is what is posited by social learning theory. While it is apparent that DEFINITIONS and ASSOCIATIONS are distinct theoretical constructs, they do have a reciprocal effect on each other. This not to say that how we define drinking determines our friends or that our association with our friends determines our definitions concerning drinking. Rather both DEFINITIONS and ASSOCIATIONS are caused by other influences that are unknown to the model presented here. What is known is that the social learning factor are reciprocally

related to each other. It is reasonable to expect, and fully consistent with social learning theory that, for the elderly, ASSOCIATIONS and DEFINITIONS are bound to the REINFORCEMENT associated with DRINKING. Perceptions of the reinforcing effects of alcohol influence how we define drinking. These definitions, in turn, provide the discriminative stimulus for framing drinking behavior.

The final and principal step in the analysis is to include all three years of the data in a single model. The variables in the standard model are used consistently for all three years of the data. In the standard (year one) model the factors DEFINITIONS and ASSOCIATIONS are exogenous or source factors. REINFORCEMENT and DRINKING are endogenous or downstream factors. DEFINITIONS and ASSOCIATIONS at year two and year three are treated as endogenous, influenced by DEFINITIONS and ASSOCIATIONS at year one.

The longitudinal model in Figure 9 is a good fitting model. The GFI = .89, the X^2/DF ratio = 1.53, the CFI = .98, the NNI = .97, and NFI = .94, the residual distribution was normal and centered around zero, and the R^2 value for DRINKING at year three is .86. It should be noted that this model required less manipulation for achieving a proper solution than many of the other models attempted during the course of this study. Several models, particularly models similar to that seen in Figure 4, were inclined to produce what are referred to in the literature as "Heywood cases." These constitute a rather awkward situation for researchers where the solution includes one or more variables, usually dependent variables, with a negative error variance and hence an R^2 value

Figure 9: Longitudinal Model of the Influence of Associations and Definitions, as Mediated by Reinforcement, on Drinking.



greater than 1.0. This, in turn, tends to result in negative eigenvalues in the solution making interpretations of the data dubious. Most structural equation modeling programs have procedures for handling Heywood cases and SAS's CALIS procedure is no exception. This model only produced negative eigenvalues in the solution as the result of misspecified correlations among error variances which were originally included to address autocorrelation. The indications are that the model shown in Figure 9 is actually superior to the model shown in Figure 8. The inclusion of longitudinal data offers considerable information and explains a higher proportion of the variance of drinking behavior among elders.

In the longitudinal model, the coefficient between REINFORCEMENT and DRINKING and the correlation between DEFINITIONS and ASSOCIATIONS are virtually identical to the coefficients found in the year one model (see Figure 8), and the path coefficient between DEFINITIONS and REINFORCEMENT is now significant. Thus, all of the relationships are significant (with the exception of ASSOCIATIONS at year two), positive and as theoretically expected. As noted previously, this model only partially specifies the relationship between the social learning variables. Considering the high inter-correlation among the social learning factors and perhaps some shortcomings in the specification of the model, it is reasonable to expect some erratic behavior when applied to modeling those variables over time. REINFORCEMENT tends to absorb all of the effects of those variables including the collinearity effects, leaving the path coefficient

between REINFORCEMENT and DRINKING in the longitudinal model (Figure 9) essentially unchanged from the results seen in the standard model (Figure 8).

There is, however, an alternate explanation for this shift in the influence of DEFINITIONS and ASSOCIATIONS which needs to be considered. It has been noted previously that one of the advantages of longitudinal research is that it can uncover developmental patterns not captured in cross-sectional analysis. Considering the high correlations between DEFINITIONS and ASSOCIATIONS and the strong relationship between REINFORCEMENT and DRINKING, it is arguable that this is an accurate representation of these relationships. More accurate, in fact, than the results seen in Figure 8. Despite a shifting in the strength and significance of the exogenous factors, the R^2 values for REINFORCEMENT and DRINKING at year one, .790 and .785 respectively, are virtually identical to the R^2 values for the standard model (Figure 8). This tends to indicate considerable stability in the standard model in a variety of configurations. Either way, it allows for the economical inclusion of all the social learning constructs in the model and a more comprehensive evaluation of the relationship between social learning and DRINKING over time.

The path coefficients are interpreted as indicators of the strength and direction of the causal influences. As can be seen in Figure 9, REINFORCEMENT, as it is influenced by DEFINITIONS and ASSOCIATIONS, shows the strongest causal effect on DRINKING at year one. These are much higher coefficients than seen in the downstream REINFORCEMENT and

DRINKING paths. This is the effect of time and the nature of the causal relationships. Recall that the year one model contains only the factors which are considered exogenous to the model and also specifies what can be considered the first outcome factor (DRINKING at time one) in the model. As such, the year one standard model establishes the baseline for the causal influences. Any subsequent effect of downstream factors is considered "above and beyond" the causal influences explained at year one. The right side of the model shows considerable consistency regarding DEFINITIONS and ASSOCIATIONS across all years of the study. One's DEFINITIONS and ASSOCIATIONS at year one are highly predictive of DEFINITIONS and ASSOCIATIONS in subsequent years. REINFORCEMENT at year one captures the bulk of the social learning effects on DRINKING at year one.

Note that the path from REINFORCEMENT at year one is .36 and from year two to year three is .38. Recall that the Lagrange Multiplier tests suggested the inclusion in the standard model of direct paths from the REINFORCEMENT indicator variables to the DRINKING factor. The reason for this becomes explicit in this model. DRINKING at year one has a strong influence on DRINKING at year two, in fact the bulk of the influence on DRINKING at year two is DRINKING at year one. However, this inertia does not completely explain subsequent drinking behavior. The influence that is not captured by previous drinking is captured by the social learning variables at year two. Direct comparisons between DEFINITIONS and ASSOCIATIONS and their paths to

REINFORCEMENT are also important in understanding the model. In the longitudinal model DRINKING at year three can be construed to be the principal dependent variable in the model. All paths are upstream and none lead from it. The dominant influences on DRINKING at year three are the contextual conditions reflected in the social learning and drinking context established at year one and the social learning variables at year three as they are mediated by social learning and drinking behavior at year two.

It is important to remember that the context of past drinking history is no longer in the model. This would indicate that the life-time patterns set the initial context in which the social learning process and drinking behavior operate at the initial stage of the study. The deletion of PAST DRINKING was justifiable because its effects are absorbed by the social learning variables. This model, to some degree, indicates the same effect over time. The measurement and structural models which included PAST DRINKING indicated that the most recent drinking behavior is predictive of future drinking. This is reflected in this model with the strongest antecedent of DRINKING at year three being DRINKING at year two. Whatever continuing effect one's past drinking behavior has on stability or change in drinking over the three year period is absorbed by the effects of social learning and current drinking on the next year's drinking patterns. The stability of drinking behavior is established at year one and carries through to DRINKING at year three. This is why there are such strong path coefficients seen between social learning and DRINKING at year one and less

dramatic coefficients in subsequent years of the model. The subsequent years of the model do not capture the initial contextual conditions, only the social learning context established in the previous year. This model clearly shows, not surprisingly, that in an elderly population there is great stability in drinking behavior from one year to the next. This stability in drinking is accompanied by and operates through the stability in the social learning factors from one year to the next.

Coda

A number of structural equation models were run on these data in an attempt to elaborate the relationships discussed in this chapter. Several subsequent models were run on the longitudinal model which specified direct and indirect paths between REINFORCEMENT at year one and DRINKING at year two and year three. In addition, models were also run which specified direct and indirect paths from DRINKING at year one and DRINKING at year three. The purpose of these model was to verify that there were no direct effects between the social learning factors and DRINKING at year one and DRINKING at year three. These models were no improvement over the model shown in Figure 9 and all indications are that the effects of the social learning factors and DRINKING at year one on DRINKING at year three are indirect through their counterparts at year two. With some exceptions related to correlated relationships and the inclusion of the PAST DRINKING factor, this tends to support the general hypothetical scheme outlined in Figure 2. In addition, the

results are supportive of the original working hypotheses (see Chapter One) and provides additional support for the utility of social learning theory in explaining both stability and change in elderly drinking behavior.

CHAPTER 6

SUMMARY AND CONCLUSIONS

Social learning theory has a solid track record as a theory with considerable utility in explaining adolescent deviant behavior. However, the theory is not limited to any particular age group, nor is it solely limited to explanations of deviant behavior. This study has focused on the application of social learning theory to the stability, and change, of drinking behavior among the elderly. The present study constitutes an extension and partial replication of the study done by Akers and La Greca (1991) which used structural equation modeling to examine the relationship between latent social learning variables (factors) and contextual influences on the drinking behavior of the elderly.

Borrowing from their basic research strategy and utilizing many of the same variables, the Akers & La Greca approach was restructured and analyzed longitudinally over three years to determine if such modifications yielded any improvement in the explanatory power of social learning theory regarding the elderly drinking behavior. In addition, while Akers and La Greca had primarily examined social learning theory and community context as they influence drinking behavior, the present study examines social learning theory and the context of one's past drinking behavior as it influences drinking among elders.

Information was presented concerning the socio-demographic and structural features of elderly drinking and methodological problems which tend to flavor public and professional perceptions of the problems of elderly drinking. In addition, a review of the gerontological literature revealed theoretical orientations and cultural biases which are not conducive to understanding the social-psychological processes which influence drinking behavior among the elderly. It was suggested that the sociological theories of deviance, particularly social learning theory, are more conducive than gerontological theories for understanding the social-psychological antecedents of elderly drinking behavior. Since previous efforts have been fruitful in applying social learning, and other sociological theories, to the problem of elderly drinking, continuation of this effort seems both prudent and germane considering our increasing elderly population. However, this is not to say that the socio-demographic considerations and gerontological perspective have no bearing on our social-psychological understanding of elderly drinking behavior. While such information is inadequate for specifying social-psychological dynamics, it does delineate the structural conditions which bear down on social learning theory. The data used in this analysis were taken from a complete data set which originally included four different communities. This sub-sample was selected for the present analysis because it provides data over three years.

The major aims of this investigation were to (1) provide a new longitudinal test for social learning theory, (2) examine the relationship between social

context and the social learning variables, (3) provide some additional specification concerning the scope and specifications of social learning theory for explaining elderly drinking, and (4) examine the utility of social learning theory as a general theory of socialization that could apply across the life course. The approach used for accomplishing this task was a longitudinal structural equation analysis.

In general, the goals of this research were achieved, albeit not in the manner originally predicted, and generally the original hypotheses were supported. The results obtained in the present analysis, for year one were slightly better at explaining the variance in drinking behavior than the results obtained in the Akers and La Greca (1991) analysis of the complete four community cross-sectional analysis (78% and 75%, respectively). However, when the analysis was extended to include repeated measures of social learning and drinking variables there was a marked improvement in the ability of the model to explain drinking behavior among the elderly. The use of longitudinal information yielded a notable improvement in the adequacy of social learning theory for explaining drinking behavior among elders. The present analysis adds to the body of literature supporting social learning theory by demonstrating that the addition of longitudinal data result in a rather high proportion of the variance of drinking behavior explained by the social learning theory model (86.8%). This is materially higher than what has been found in previous studies.

One of the most striking finding of the study is the failure of the lifetime past drinking factor to inform the statistical model. The year one model, which included the past drinking context, showed that information about drinking behavior prior to the elder years offers no contribution to the model with regard to strength or significance of influence on current drinking behavior as measured at year one. The year one model which included information concerning drinking prior to the elder years was virtually identical in terms of causal and correlated relationships when compared to the year one model which excluded information concerning drinking prior to the elder years. This is consistent with social learning theory and previous research using structural equation models in that the influence of past drinking would be considered to be indirect through the social learning variables. This is similar to results encountered by Akers and La Greca (1991) and the influence of community context on drinking behavior. In their analysis, they concluded that the effects of community context were indirect through the social learning variables. In this analysis, the lack of change in the theoretical model by the deletion of the past drinking factor, despite the significance of the indicator variables, demonstrates that the influence of past drinking behavior is not simply indirect through social learning processes, but nearly totally subsumed by those processes. While the utility of past drinking behavior, as a contextual consideration, is questionable in predicting current or future alcohol use, there is additional support for implicit assumptions regarding social learning theory. Namely, contextual consideration, both cultural (as

demonstrated by Akers and La Greca, 1991) and behavioral (as demonstrated in this investigation), are captured within the social learning constructs.

However, this interpretation of the different year one structural models is tempered by results obtained when the analysis is extended longitudinally over the three years of the study. What emerges in the longitudinal model is that the previous year's drinking behavior, as contrasted with the lifetime pattern of previous drinking, does have a considerable effect on current drinking behaviors. This raises the issues of the adequacy of the variables used for measuring drinking prior to the elder years. It is quite possible that problems may exist with the method of data collection. The inclusion of the pattern of drinking prior to the elder years was prompted by previous research by Dunham (1983) which measured drinking behavior in a panel study over the life course. The data in the present analysis depends on the respondent's recollections of past drinking behavior. It is possible that the differences in how past drinking behavior is measured has yielded different results.

General concerns regarding survey data are applicable to the retrospective measures of past drinking used in the present study. Respondents may deliberately lie because the question is too sensitive or they simply do not know the answer. They may make unconscious mistakes or accidental errors because they simply do not understand the question. In addition, failing memories associated with the ability of respondents to recall past events may yield inaccurate information (Bailey 177: 1987). Perhaps the greatest concern in

cases of elderly respondents may be with regard to memory failures. It seems reasonable to assume that the further in the past that events occur, the greater the difficulty of recall. However, this may not be quite as straight forward as one would think. Research on memory loss with the elderly in recent years indicates that, surprisingly, elders have better long-term memory than short-term memory (Brown, 1996; Perlmutter and Hall, 217-19:1985). This may be in part due to a greater orientation to the past or greater emotional response associated with past event. In either case, there is no indication that elders are prone to greater recall errors that would be seen in any other population and perhaps they are slightly better than most. However, the issue of memory failure, or other errors, on the part of respondents concerning drinking prior to the elder years remains a nagging concern.

There is, however, an alternate explanation which may be more accurate in understanding the relationship between past drinking and current drinking behavior. Assuming that there is at least a modicum of validity regarding the retrospective measures of past drinking used in this study, it may be more accurate to argue that only the more recent drinking behavior patterns exhibited by elders is predictive of current drinking behavior. In the structural equation model used in the present analysis there is an obvious decreasing effect of past drinking on current drinking behavior. This is demonstrated in both the measurement models and structural models. What appears to occur is that the further in the past that the drinking behavior occurs, the less influence it has on

current drinking. While drinking behavior in the previous year may have a considerable effect on current drinking, drinking behavior in the previous decade may have less influence. The further in the past one goes to measure drinking behavior, the less influence it will have on current drinking. However, this influence is not completely lost. The more time that passes, the more likely that the effects of past drinking will be subsumed by the social learning variables. Past drinking behavior prior to the elder years is, in effect, revealed in the current definitions that one holds concerning drinking, one's current associations with drinkers, and one's current interpretations concerning the reinforcing effects of drinking. Dunham's contention concerning the static nature of drinking across the life course (1983) is not supported here. If only information about drinking prior to the elder years is available to researchers and clinicians, then such measures may be useful. However, if operationalized theoretical constructs are available, specifically social learning variables, information about drinking prior to the elder years becomes an inferior predictor of current drinking among elders.

Collectively, and in a broader sense, the present analysis and the analysis by Akers and La Greca (1991) raises questions concerning the impact of contextual variables in future research. While it may be presumptuous to argue that future analysis on social learning theory and contextual considerations should be abandoned, a reasonable prediction is that such efforts will not yield any different results. The results obtained in the present study coupled with the results obtained by Akers and La Greca (1991) and Akers and Lee (1996)

indicate that the influence of contextual considerations on drinking behavior are, across time, either indirect or nearly totally subsumed through social learning. It is possible, indeed probable, that future research along these lines will yield similar results.

Regarding the issue of improved specification of social learning theory, this analysis provided some elaboration concerning the relationship between the social learning factors and the drinking behavior of elders, although not as originally hypothesized. It was originally hypothesized that the relationships between definitions, differential reinforcement, and differential associations were simply correlated relationships which would collectively have a strong direct influence on elderly drinking behavior. This was a different specification of social learning theory than used by Akers and La Greca (1991) which subsumed definitions, differential reinforcement, and differential associations under a second-order factor--social learning. It was believed that this specification would be an improvement over the Akers and La Greca model as it was more parsimonious and allowed for the estimation of all of the path coefficients.

Specifying the model in this manner yielded anomalous results which required at least a partial specification of the relationship between the social learning factors themselves. Considering the previous research results (Akers and La Greca, 1991; Akers, et al., 1989; Akers, et al., 1988) concerning the impact of differential reinforcement on elderly drinking the statistical model was modified showcasing the relationship between differential reinforcement and

drinking behavior with definitions and differential associations having a causal influence only on differential reinforcement. This model, which is well within the scope of social learning theory, demonstrates that the relationship between the social learning variables cannot be assumed to simply be one of correlation.

There are a number of complex causal and reciprocal relationships which exists between the operationalized factors of definitions, differential association, and differential reinforcement. Structural equation models which do not account for causal or reciprocal relationships between social learning factors may, therefore, be misspecifications of social learning theory. While the reciprocal and causal relationships between social learning variables is integral to a comprehensive understanding of the theory, this analysis offers, at least partially, empirical evidence of both the existence and the nature of those causal relationships with reference to elders and their drinking behavior. In addition, the influence of differential reinforcement (as it is caused by definitions and differential associations) on drinking behavior highlights, and further specifies, the importance of the relationship between drinking behavior and perceptions concerning the reinforcing effects of alcohol.

The modification indices for the structural equation models used in the present analysis repeatedly called for the specification of direct paths between the indicator variables for differential reinforcement and the latent factor for drinking. This indicates that in this age group continued alcohol use may be reinforced by physiological effects or the perception of those effects. Drinking (or

abstinence) is, in and of itself, a reinforcer of continued drinking (or abstinence). Any changes in drinking behavior are reflective of changes in perceptions of the reinforcing effects of alcohol. These are, in turn, reflective of changes in definitions and differential associations. This does, therefore, constitute additional support for social learning theory and its application to understanding the drinking behavior of elders in our society. Regarding the scope and dynamics of the social learning factors, support is provided here for the notion of the balancing principle of the social learning factors themselves. Not only can there be considerable variation in influences of the social learning factors, the dynamics and interactions between the social learning factors must be considered in evaluating the causes of differential drinking behavior among elders (and probably other groups as well).

What emerges here is not a model of change concerning the drinking behavior of elders, but rather a model of stability of their drinking behavior. There is nothing in the data to indicate any pattern of changes in drinking behavior contrary to the typical patterns of drinking seen with elders. More importantly, what tends to drive and influence drinking behavior among the elderly is not necessarily past drinking but rather the values and direction of the social learning variables. The decreasing influence of past drinking behavior coupled with the stability of the social learning variables indicates that not only does social learning hold sway regarding drinking behavior but it also provides explanations concerning the stability of drinking behavior with elders. This

demonstrates that social learning theory can be applied not only to the more variable drinking behavior of youthful drinkers but to more stable patterns of drinking seen in the elderly. Stability in drinking is accompanied by stability in the social learning factors. Change in drinking behavior reflects, to a large extent, changes in the social learning factors. The same theoretical variables account for drinking regardless of age, but the values and operation of variables are not necessarily the same at each age (Tittle, 1995; Akers and Lee, 1996).

With more youthful drinkers, the impetus for the initiation of drinking behavior is rooted in social reinforcement and acceptance by peers and the imitation of the behavior of peers (and to some extent parents). While this peer influence is not lost with elders, it, along with one's definitions concerning drinking, is mediated by the non-social reinforcements associated with alcohol use. The stable definitions and associations are reflected in, and to some degree overwhelmed by, social and non-social reinforcing effects of alcohol use. Assuming that the empirical results obtained in this investigation are sound, then differences between youngsters and elders lies in how drinking behavior is defined. In general, youth may not experience as much negative reinforcement or natural consequences associated with alcohol use as do elders because of the effects of advancing age. This, therefore, leaves youngsters with more positive or neutralizing definitions concerning drinking. This is quite consistent with the premise of social learning theory. At the individual level, the greater the problems one experiences with alcohol, the less likely one is to define its use in

positive terms or associate with drinkers and, in turn, the strength of the social and non-social reinforcers serves to provoke or circumscribe individual drinking.

This indicates that the influence of the social learning factors is quite stable over time. The definitions one holds and the associations one maintains regarding drinking do not change considerably from one year to the next. Therefore, knowledge of social learning variables at year one becomes a solid predictor of personal definitions, types of associations, and subsequently, perceptions of reinforcers in subsequent years. This indicates that there is, in all probability, little change in the drinking behavior of friends or the proportion of drinking friends across time or one's personal definitions about drinking. However, the influence of differential reinforcement tends to be reflective of the more immediate consequence of the drinking itself. While definitions and differential associations are quite fixed in a more sociological sense, differential reinforcement is more fixed in a psychological or behavioral sense. Just as one's social network may not change appreciably over time, as implied in the longitudinal model, one's definitions do not change appreciably either. Recall, from the measurement model, that the social learning variables are highly correlated with each other. Social learning theory recognizes the importance of social reinforcement regarding one's social network and personal definitions and the subsequent effect on drinking behavior. While differential associations and definitions are unidimensional constructs in the models presented here, it would be erroneous to imply that there is no reinforcement embodied in them. The

Akers-Burgess reformulation of Sutherland's theory of Differential Association was intended to specify the learning processes by incorporating concepts drawn from behavioral psychology. Therefore, the latent social learning constructs specified here are simply different aspects of the overarching social learning process. Essentially, this model exemplifies and reflects the *balancing principle* of the theoretical constructs of Definition, Differential Associations, Differential Reinforcement and, to a lesser degree, the notions of Imitation specified in the complete formulation of social learning theory. The reciprocal or causal influences of the social learning constructs give rise to the patterns of the outcome measures of interest--the drinking behavior of elders.

The focus of this investigation is to offer additional support for social learning theory, examine the influence of contextual conditions, and to further elaborate the scope of the theory as a developmental theory of socialization. While much of this has been achieved there remain certain limitations with this investigation. Despite the apparent lack of difference noted with this sample when compared to other subsets of the data, there remains a concern regarding regional or cultural differences which may influence the results. Although none were detected in comparisons of the sample used here, the sample cannot be absolved of any shortcomings in this area. There may be unique influences concerning the sample itself which are undetected by the analyses done here. Nevertheless, it seems safe to conclude that the information gleaned here is applicable to elders and perhaps other select groups as well. No doubt, there

are limitation with the sample and it would be most imprudent to make gross generalization about the result; however, it seems reasonable to expect such results to occur in other elderly groups as well. There is at least room, with the results seen here, to warrant additional investigation and verification. Just as it would be naive to say the dynamics which emerge here are completely unique to this population, it would be rather hasty to say that these results will be wholly reflected in other samples. More research is needed to anchor alcohol and drug use in a empirically verified theoretical context which will aid us in establishing reasonable public policies to address the needs of the elderly in the future.

Assuming that a reasonable approach has been taken in the specification of items in the collection instrument and the design of the structural model, there are several pertinent implications concerning the results reported here. The use of longitudinal designs in the investigation of deviant behavior is a controversial issue in the extant literature. There are, however, intimations in this investigation that longitudinal designs and panel studies offer some information that might not be as readily recognized when using cross-sectional data. The advantage of using the respondents as their own controls over time to delineate change, or in this case stability, offers a clear advantage regarding the interpretation of the results and lends credence to the potential of longitudinal studies in the future. Despite the limitations of the retrospective Past Drinking variables, when coupled with the results from the longitudinal model, the decreasing influence of past drinking on current drinking is quite apparent. While such results might be

replicated in cross-sectional investigations, there is greater opportunity for speculation concerning cohort effects, period effects, and various other extraneous influences that need to be accounted for, or at least acknowledged. The longitudinal approach used here, despite the limitations, tends to provide some greater confidence concerning the results obtained. This is not to say that the results are perfectly valid or reliable, only that it is arguable that results obtained here are more persuasive than similar results which might be obtained from cross-sectional data.

In terms of the practical implications of the results, the matter of past drinking as a predictor of current or future drinking is perhaps the most dramatic outcome. The results obtained here raise numerous questions concerning the utility of predicting current or future drinking based on past drinking behavior, particularly with regard to alcohol abuse among elderly populations. As seen in Table 5, there is no reference in the frequency distribution of drinking behavior with this sample focusing on alcohol abuse. While some proportion of drinkers report daily use of alcohol, this does not indicate that daily use constitutes the abuse of alcohol. In fact, it has become common knowledge that regular, light drinking (1-2 drinks per day) may in fact be beneficial and quite healthy. Previous work with this data set indicates that the rates of problem drinking are, in fact, quite low. In the entire sample (N=1410), 6.4% are considered to be excessive or heavy drinkers and 3.1% are problem drinkers (Akers, 1992: 204). These are lower than comparable rates of alcohol abuse in the non-elderly

population. However, such rates can produce monumental problems for social and health service providers because of the sheer number of referrals for treatment (which will no doubt increase in the next century).

With regard to the clinical response to alcohol abuse, it has long been a tradition to obtain information concerning the past drinking of those considered to be alcohol abusers, problem drinkers, or alcoholics. This information is considered essential to developing a comprehensive understanding of current drinking behavior. The results obtained here indicate that clinicians who depend on information concerning past drinking behavior to assess current drinking behavior may, in fact, be approaching the problem in an overly-simplistic manner. Furthermore, the basic concept of late-onset drinking in the elderly relies on the failure of past drinking to predict current or future drinking. As noted earlier, Dunham's (1983) conclusions concerning the influence of past drinking are not supported in this investigation. However, Adams & Waskel's (1992) work, which was previously discussed, does receive some support here. In their work they concluded that social-psychological influences related to the social control of drinking, imposed by a spouse, may serve to inhibit drinking behavior. Widowhood results in the loss of that social control resulting in increases in drinking behavior for certain elders. Such notions are well within the scope of social learning theory and imply that social-psychological conditions, namely Reinforcement, Differential Association, and Definitions have greater predictive promise concerning drinking behavior than knowledge of past drinking behavior.

This is essentially the interpretation of the data resulting in this study. It is not one's past drinking that necessarily drives current drinking behavior but rather the influence of social-psychological conditions as specified in social learning theory.

Unfortunately, this line of reasoning tends to raise more questions concerning the etiology of alcohol abuse among elders. If such dynamics do occur then the current ideology concerning the disease model of addiction must also come into question. Is alcoholism a chronic, life-long condition or is it subject to the same influences purported by the results obtained here? If knowledge of past drinking has only limited utility in improving our understanding of drinking behavior for a group with relatively low rates of alcohol use, what then are the implications for using that same information to understand alcohol abuse? Would similar results be observed in samples consisting of only those elders diagnosed as alcohol abusers or alcoholics? Can this perspective be generalized to that small population of elders who experience late-onset alcoholism? Further research is necessary to answers such questions.

Finally, this investigation offers additional support for social learning theory and its utility as a general theory of socialization across the life course. The outcome of the analysis generally supported previous research concerning the influence of the social learning variables. Differential Reinforcement tends to hold the strongest influence over drinking behavior, followed in order of causal influence by Definitions and then Differential Association.

There is additional support for the general relationship between social context and the social learning variables. Previously research showed support for the notion that the normative or cultural context in which individuals reside is by and large indirect through the social learning variables. This has been previously discussed with regard to the work concerning the relationship between community context and social learning variables (Akers & La Greca, 1992). This investigation offers additional support that contextual conditions are mediated by the processes of social learning. While the past drinking variable is rooted more in a behavioral/interactional context, it is virtually subsumed within the processes of social learning. It is in this sense that this research extends and offers empirical support for the scope of the theory. Not only is the normative/cultural context of one's experience mediated by the social learning processes, but also behavior/interactional context of one's experience. This underscores the foundation concept of social learning theory in that it is both the exposure to cultural influences, manifest in the larger social order, and the immediate interactional influences of associations which collectively influence both deviant and non-deviant behavior. Regardless of the pattern of drinking behavior, whether abstinent or heavy, and the larger social context, the explanation of stability and change in drinking behavior is rooted in the social learning processes.

APPENDIX A SELECTED SURVEY ITEMS

The following selected survey items were taken from the Survey of Alcohol Use/Non-use. These specific items were used in the construction of variables for investigation. Other variables relevant to demographic characteristics and socio-economic status were also used.

Alcohol Behavior

1. Frequency

v108 (beer), v109 (wine),v110 (liquor) - Self-reported frequency of use past 12 months.

#75 How often in the past 12 months have you used: BEER

#76 How often in the past 12 months have you used: WINE

#77 How often in the past 12 months have you used: LIQUOR

1 = Never

2 = Once or twice

3 = Less than once a month

4 = Once a month

5 = 2-3 times a month

6 = Once or twice a week

7 = 3-4 times a week

8 = Nearly every day

9 = Everyday

v115 (beer), v116 (wine),v117 (liquor) - Self-reported frequency of drinking in past 30-days.

#81 How often in the past 30 days have you had at least one drink of: BEER

#82 How often in the past 30 days have you had at least one drink of: WINE

#83 How often in the past 30 days have you had at least one drink of: LIQUOR

1 = Never

2 = Once

3 = 2-3 times

4 = Once or twice a week

5 = 3-4 times a week

6 = Nearly ever day

7 = Every day

8 = ND

9 = No answer

2. Quantity/Frequency Index

v124 - Quantity of beer consumed on a typical day.

#D-84 During the past 12 months, how much beer did you drink on a typical day on which you drank beer?

00 = Do not drink beer

01 = 1 12 oz can or bottle

02 = 2 cans

03 = 3 cans (1 quart)

04 = 4 cans

05 = 5 cans

06 = 6 cans

07 = 7 cans

08 = 8-9 cans

10 = 10-11 cans

12 = 12 or more cans

88 = ND

99 = No answer

v125 - Quantity of wine consumed on a typical day.

#D-85 During the past 12 months, how much wine did you drink on a typical day on which you drank wine?

00 = Do not drink wine

01 = 1 glass (4 oz.)

02 = 2 glasses

03 = 3 glasses

04 = 4 glasses

05 = 5 glasses

06 = 6 glasses

07 = 7 glasses

08 = 8-9 glasses

10 = 10-11 glasses

12 = 12 or more glasses

88 = ND

99 = No answer

v126- Quantity of liquor consumed on a typical day.

#D-86 During the past 12 months, how much liquor did you drink on a typical day on which you drank liquor?

00 = Do not drink liquor

01 = 1 drink w/ 1 oz liquor

02 = 2 drinks

03 = 3 drinks

04 = 4 drinks

05 = 5 drinks

06 = 6 drinks

07 = 7 drinks

08 = 8-9 drinks

10 = 10-11 drinks

12 = 12 or more drinks

88 = ND

99 = No answer

Social Learning Variables--Definitions

1. Positive/Negative Definitions

V68 - Own definitions (attitude toward drinking).

#35 As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?

Yourself

1 = approve

2 = sometimes approve, sometimes disapprove

3 = disapprove

4 = no definite attitude

7 = don't know

8 = na (no such person(s))

9 = no answer

2. Neutralizing Definitions

v458 - Neutralizing definition: Controlled

#188 "It's all right for people to drink as long as they control it."

1 = strongly agree

2 = agree

3 = uncertain

4 = disagree

5 = strongly disagree

9 = no answer

v462 - Neutralizing definition: Makes happy

#192 If it makes a person happy, even heavy drinking is okay."

1 = strongly agree

2 = agree

3 = uncertain

4 = disagree

5 = strongly disagree

9 = no answer

v463 - Neutralizing definition: Watches diet

#193 "If you watch our diet, even heavy drinking will not have bad health effects."

1 = strongly agree

2 = agree

3 = uncertain

4 = disagree

5 = strongly disagree

9 = no answer

3. Proscriptive Definitions

v464 - Negative definition: Never approve

#194 "I never approve of the use of alcohol."

1 = strongly agree

2 = agree

3 = uncertain

4 = disagree

5 = strongly disagree

9 = no answer

v466 - Negative definition: Wrong to get drunk

#196 "I feel it is wrong to get drunk."

1 = strongly agree

2 = agree

3 = uncertain

4 = disagree

5 = strongly disagree

9 = no answer

4. Prescriptive Definitions

v465 - Definition: Special occasions

195 "I approve of the use of alcohol on special occasions."

- 1 = strongly agree
- 2 = agree
- 3 = uncertain
- 4 = disagree
- 5 = strongly disagree
- 9 = no answer

5. General Definitions

v461 - Belief: Law abiding duty

#191 "We all have a moral duty to abide by the law."

- 1 = strongly agree
- 2 = agree
- 3 = uncertain
- 4 = disagree
- 5 = strongly disagree
- 9 = no answer

v592 - Religiosity: Importance of religion

315 "My religious beliefs play a very important role in my life."

- 1 = strongly agree
- 2 = agree
- 3 = uncertain
- 4 = disagree
- 5 = strongly disagree
- 8 = na
- 9 = no answer

Social Learning Variables--Differential Association

6. Spouse's Norms

v69 - Norm qualities: Perceived attitudes toward drinking of spouse

#36 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
YOUR SPOUSE

- 1 = approve
- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

7. Family Norms

v70 - Norm qualities: Perceived attitudes toward drinking of children

#37 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
YOUR CHILDREN

- 1 = approve
- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

v71 - Norm qualities: Perceived attitudes toward drinking of close family

#38 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
OTHER CLOSE FAMILY MEMBERS

- 1 = approve
- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

8. Friends' Norms

v72 - Norm qualities: Perceived attitudes toward drinking of best friends

39 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
MOST OF YOUR BEST FRIENDS

- 1 = approve

- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

v73 - Norm qualities: Perceived attitudes toward drinking of most frequent friends

40 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
MOST OF YOUR FRIENDS WITH WHOM YOU HAVE ASSOCIATED MOST FREQUENTLY

- 1 = approve
- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

v74 - Norm qualities: Perceived attitudes toward drinking of longest time friends

#41 "As far as you know, what is the general attitude of each of the following people toward drinking alcoholic beverages (that is, beer, wine, and liquor)?"
MOST OF YOUR FRIENDS WITH WHOM YOU HAVE ASSOCIATED FOR THE LONGEST TIME

- 1 = approve
- 2 = sometimes approve, sometimes disapprove
- 3 = disapprove
- 4 = no definite attitude
- 7 = don't know
- 8 = na (no such person(s))
- 9 = no answer

9. Spouse's Drinking

v83 - Perceived drinking behavior of spouse

#50 "Now tell me, to the best of your knowledge, about how often do each of the following people usually drink alcoholic beverages (that is, beer, wine, or liquor)"
YOUR SPOUSE

01 = never
 02 = once
 03 = less than once a month
 04 = once a month
 05 = 2-3 times a month
 06 = once or twice a week
 07 = 3-4 times a week
 08 = nearly every day
 09 = everyday
 88 = na (no such person(s))
 98 = don't know
 99 = no answer

10. Adult Children's Drinking

v84 - Perceived drinking behavior of children

#51 "Now tell me, to the best of your knowledge, about how often do each of the following people usually drink alcoholic beverages (that is, beer, wine, or liquor)"
 YOUR CHILDREN

01 = never
 02 = once
 03 = less than once a month
 04 = once a month
 05 = 2-3 times a month
 06 = once or twice a week
 07 = 3-4 times a week
 08 = nearly every day
 09 = everyday
 88 = na (no such person(s))
 98 = don't know
 99 = no answer

11. Other Family Drinking

v85 - Perceived drinking behavior of close family - other than spouse or children

#52 "Now tell me, to the best of your knowledge, about how often do each of the following people usually drink alcoholic beverages (that is, beer, wine, or liquor)"
 OTHER CLOSE FAMILY MEMBERS

01 = never
 02 = once
 03 = less than once a month

- 04 = once a month
- 05 = 2-3 times a month
- 06 = once or twice a week
- 07 = 3-4 times a week
- 08 = nearly every day
- 09 = everyday
- 88 = na (no such person(s))
- 98 = don't know
- 99 = no answer

12. Best Friends' Drinking

v86 - Perceived drinking behavior of best friend

#62 "Now tell me, to the best of your knowledge, about how often do each of the following people usually drink alcoholic beverages (that is, beer, wine, or liquor)"

BEST FRIEND

- 01 = never
- 02 = once
- 03 = less than once a month
- 04 = once a month
- 05 = 2-3 times a month
- 06 = once or twice a week
- 07 = 3-4 times a week
- 08 = nearly every day
- 09 = everyday
- 88 = na (no such person(s))
- 98 = don't know
- 99 = no answer

13. Proportion of Drinking Friends

v95 - Proportion of best friends drinking (intensity of association)

#62 "About how many of your _____ drink alcoholic beverages at least some times?"

BEST FRIENDS

- 0 = none, or almost none
- 1 = less than half
- 2 = more than half
- 3 = almost all, or all
- 7 = don't know
- 9 = no answer

v96 - Proportion of longest time friends (duration of association)

#63 "About how many of your _____ drink alcoholic beverages at least some times?"

FRIENDS YOU HAVE KNOWN THE LONGEST

0 = none, or almost none

1 = less than half

2 = more than half

3 = almost all, or all

7 = don't know

9 = no answer

v97 - Proportion of frequent friends (frequency of association)

#64 "About how many of your _____ drink alcoholic beverages at least some times?"

FRIENDS YOU ARE WITH THE MOST

0 = none, or almost none

1 = less than half

2 = more than half

3 = almost all, or all

7 = don't know

9 = no answer

Social Learning Variables--Differential Reinforcement14. Balance of Social Reinforcementv338 - Social effects of alcohol (social reinforcement)

#D132 "Aside from these direct physical effects, how would you describe what alcohol does to your or for you such as how it affects your relationships, whether or not you have a good time, and how it makes you feel."

1 = mainly good effects

2 = about as much good as bad

3 = mainly bad effects

4 = no effects

8 = nd

9 = no answer

15. Spouse's Reactionsv368 - Reactions to drinking: Spouse

#135 "What is the usual reaction of each of the following, when you drink."

YOUR SPOUSE

- 1 = approve and encourage
- 2 = approve, but no encouragement
- 3 = no reaction
- 4 = disapprove, but no discouragement
- 5 = disapprove and discourage
- 6 = more than one response indicated
- 7 = na (no such persons)
- 8 = nd
- 9 = no answer

16. Family's Reaction

V369 - Reactions to drinking: Children's

#136 "What is the usual reaction of each of the following, when you drink."

YOUR CHILDREN

- 1 = approve and encourage
- 2 = approve, but no encouragement
- 3 = no reaction
- 4 = disapprove, but no discouragement
- 5 = disapprove and discourage
- 6 = more than one response indicated
- 7 = na (no such persons)
- 8 = nd
- 9 = no answer

v370 - Reactions to drinking: Other family members

137 "What is the usual reaction of each of the following, when you drink."

OTHER FAMILY MEMBERS

- 1 = approve and encourage
- 2 = approve, but no encouragement
- 3 = no reaction
- 4 = disapprove, but no discouragement
- 5 = disapprove and discourage
- 6 = more than one response indicated
- 7 = na (no such persons)
- 8 = nd
- 9 = no answer

17. Friends' Reaction

v371 - Reactions to drinking: Friends

#138 "What is the usual reaction of each of the following, when you drink."

YOUR CLOSE FRIENDS

1 = approve and encourage

2 = approve, but no encouragement

3 = no reaction

4 = disapprove, but no discouragement

5 = disapprove and discourage

6 = more than one response indicated

7 = na (no such persons)

8 = nd

9 = no answer

18. Balance of Physical Effectsv337 - Physical effects of alcohol (non-social reinforcements)

#131 "What direct physical effects do you usually get from drinking alcohol?"

That is, the direct effects of alcohol on you, such as your reflexes, taste, or health (not on your relationships with other people or your emotions).

1 = mainly good effects

2 = about as much good as bad

3 = mainly bad effects

4 = no effects

8 = nd

9 = no answer

19. Balance of Rewards/Costsv350-v358 - Good effects of alcohol (positive reinforcement)

#D. 133 "Which of the following good things happen to you from drinking alcohol?"

(Check all that apply)

v350 - relax

_____ helps me to relax

v351 - feeling

_____ gives me a satisfying/rewarding feeling

v352 - get along

_____ helps me get along with others

v353 - energy

_____ gives me energy/peps me up

v354 - meet people

_____ helps me meet people/helps me make new friends

v355 - taste

___ I get enjoyment from the taste

v356 - leisure

___ helps me enjoy leisure activities

v357 - motivation

___ gives me motivation to do things

v358 - no good things

___ no good things

___ no answer

0 = not checked

1 = checked

8 = nd

9 = no answer (bottom line "no answer" checked)

v359-v367 - Bad effects of alcohol (punishers)

#D. 134 "Which of the following bad things happen to you from drinking alcohol?"

(Check all that apply)

v359 - guilty

___ makes me feel guilty

v360 - sick

___ makes me feel sick or hungover

v361 - trouble

___ have trouble getting along with others

v362 - taste

___ tastes bad

v363 - health

___ harms health

v364 - interferes

___ interferes with leisure activities

v365 - cost

___ costs too much money

v366 - criticized

___ criticized by family and friends

v367 - no bad things

___ no bad things

___ no answer

0 = not checked

1 = checked

8 = nd

9 = no answer (bottom line "no answer" checked)

APPENDIX B
MEANS, STANDARD DEVIATIONS, AND BIVARIATE CORRELATIONS FOR
SELECTED VARIABLES

Variable	Mean	Std. Dev.
OWNDEF1	1.77982	0.79
PRONA1	3.12385	1.31222
FRIDRIN1	3.33846	2.69293
PRFDRIN1	2.30622	1.17658
PHYREIN1	1.62963	0.7869
REWCOST1	2.53023	1.26555
YFREQUAL1	1.80734	1.11939
MFREQUAL1	1.77064	1.12478
DRINKDUN	2.23853	1.13104
YA_DRIN	0.83945	0.81851
A_DRIN	0.87615	0.86311
OA_DRIN	0.68349	0.78335
OWNDEF2	1.73148	0.63109
PRONA2	3.11927	1.14983
FRIDRIN2	3.21809	2.60632
PRFDRIN2	2.40887	1.23889
PHYREIN2	1.66509	0.77763
REWCOST2	2.59535	1.36411
YFREQUAL2	1.77523	1.08187
MFREQUAL2	1.79817	1.10115
OWNDEF3	1.78704	0.78053
PRONA3	3.16129	1.23571
FRIDRIN3	3.42021	2.74559
PRFDRIN3	2.27861	1.196
PHYREIN3	1.69585	0.73718
REWCOST3	2.72558	1.22721
YFREQUAL3	1.77982	1.07641
MFREQUAL3	1.74312	1.07681

	OWNDEF1	PRONA1	FRIDRIN1	PRFDRIN1
OWNDEF1	1	0.67545	0.60915	0.59536
PRONA1	0.67545	1	0.56016	0.59341
FRIDRIN1	0.60915	0.56016	1	0.61259
PRFDRIN1	0.59536	0.59341	0.61259	1
PHYREIN1	0.60484	0.55786	0.56347	0.57617
REWCOST1	0.66581	0.64715	0.60562	0.65159
YFREQUAL1	0.62925	0.58103	0.62913	0.63097
MFREQUAL1	0.6171	0.55012	0.61807	0.60513
DRINKDUN	0.49227	0.51095	0.54431	0.6055
YA_DRIN	0.35843	0.37042	0.33274	0.37267
A_DRIN	0.50049	0.47338	0.47142	0.45713
OA_DRIN	0.59429	0.62559	0.63711	0.65145
OWNDEF2	0.64377	0.63427	0.50405	0.60802
PRONA2	0.56172	0.6346	0.51128	0.55063
FRIDRIN2	0.48595	0.52479	0.66375	0.61825
PRFDRIN2	0.54163	0.59825	0.5446	0.67921
PHYREIN2	0.49452	0.46682	0.43401	0.48084
REWCOST2	0.60114	0.5641	0.50492	0.55007
YFREQUAL2	0.61581	0.54232	0.58827	0.59404
MFREQUAL2	0.57377	0.46387	0.54426	0.54371
OWNDEF3	0.64264	0.61882	0.51214	0.57911
PRONA3	0.50312	0.54657	0.43368	0.40833
FRIDRIN3	0.48073	0.46768	0.53337	0.63325
PRFDRIN3	0.60821	0.58525	0.63946	0.72098
PHYREIN3	0.46212	0.50929	0.40467	0.45202
REWCOST3	0.57694	0.57923	0.54388	0.54354
YFREQUAL3	0.56051	0.52183	0.57851	0.60574
MFREQUAL3	0.55076	0.50856	0.55822	0.5926

	PHYREIN1	REWCOST1	YFREQUAL1	MFREQUAL1
OWNDEF1	0.60484	0.66581	0.62925	0.61771
PRONA1	0.55786	0.64715	0.58103	0.55012
FRIDRIN1	0.56347	0.60562	0.62913	0.61807
PRFDRIN1	0.57617	0.65159	0.63097	0.60513
PHYREIN1	1	0.78316	0.81187	0.7509
REWCOST1	0.78316	1	0.73279	0.69122
YFREQUAL1	0.81187	0.73279	1	0.94931
MFREQUAL1	0.7509	0.69122	0.94931	1
DRINKDUN	0.50167	0.49888	0.57516	0.55034
YA_DRIN	0.28381	0.33614	0.29804	0.30019
A_DRIN	0.45208	0.48874	0.47124	0.45004
OA_DRIN	0.66867	0.65815	0.70793	0.67037
OWNDEF2	0.54711	0.60877	0.59356	0.57677
PRONA2	0.54817	0.60405	0.54066	0.51653
FRIDRIN2	0.56093	0.58688	0.59614	0.57368
PRFDRIN2	0.53157	0.65896	0.55822	0.52338
PHYREIN2	0.60529	0.58615	0.63319	0.63888
REWCOST2	0.62371	0.72689	0.68271	0.67572
YFREQUAL2	0.70691	0.67151	0.8507	0.83603
MFREQUAL2	0.63524	0.59808	0.78333	0.78845
OWNDEF3	0.57904	0.66087	0.59742	0.58036
PRONA3	0.40445	0.53688	0.4418	0.4307
FRIDRIN3	0.54072	0.54299	0.59403	0.5768
PRFDRIN3	0.58091	0.62983	0.6281	0.6156
PHYREIN3	0.57102	0.59777	0.58424	0.54013
REWCOST3	0.57458	0.67196	0.61489	0.60462
YFREQUAL3	0.66898	0.63929	0.80603	0.79166
MFREQUAL3	0.65262	0.62635	0.79602	0.78058

	DRINKDUN	YA_DRIN	A_DRIN	OA_DRIN
OWNDEF1	0.49227	0.35843	0.50049	0.59429
PRONA1	0.51095	0.37042	0.47338	0.62559
FRIDRIN1	0.54431	0.33274	0.47142	0.63711
PRFDRIN1	0.6055	0.37267	0.45713	0.65145
PHYREIN1	0.50167	0.28381	0.45208	0.66867
REWCOST1	0.49888	0.33614	0.48874	0.65815
YFREQUAL1	0.57516	0.29804	0.47124	0.70793
MFREQUAL1	0.55034	0.30019	0.45004	0.67037
DRINKDUN	1	0.58414	0.71489	0.82418
YA_DRIN	0.58414	1	0.6436	0.38036
A_DRIN	0.71489	0.6436	1	0.62333
OA_DRIN	0.82418	0.38036	0.62333	1
OWNDEF2	0.48397	0.41575	0.5055	0.51959
PRONA2	0.50246	0.40236	0.4793	0.53326
FRIDRIN2	0.55872	0.40155	0.50006	0.61963
PRFDRIN2	0.49858	0.3784	0.4993	0.55938
PHYREIN2	0.42657	0.35439	0.41397	0.49851
REWCOST2	0.4404	0.33944	0.4833	0.52739
YFREQUAL2	0.51854	0.34416	0.49811	0.61168
MFREQUAL2	0.49025	0.30645	0.4536	0.54532
OWNDEF3	0.4713	0.31564	0.44095	0.58425
PRONA3	0.41694	0.30747	0.36378	0.46639
FRIDRIN3	0.50234	0.27258	0.38264	0.54919
PRFDRIN3	0.61361	0.40391	0.51272	0.61482
PHYREIN3	0.44667	0.29293	0.40405	0.53478
REWCOST3	0.54148	0.32673	0.43687	0.60346
YFREQUAL3	0.53162	0.3049	0.45165	0.60558
MFREQUAL3	0.53487	0.27193	0.44161	0.59699

	OWNDEF2	PRONA2	FRIDRIN2	PRFDRI2
OWNDEF1	0.64377	0.56172	0.48595	0.54163
PRONA1	0.63427	0.6346	0.52479	0.59825
FRIDRIN1	0.50405	0.51128	0.66375	0.5446
PRFDRI1	0.60802	0.55063	0.61825	0.67921
PHYREIN1	0.54711	0.54817	0.56093	0.53157
REWCOST1	0.60877	0.60405	0.58688	0.65896
YFREQUAL1	0.59356	0.54066	0.59614	0.55822
MFREQUAL1	0.57677	0.51653	0.57368	0.52338
DRINKDUN	0.48397	0.50246	0.55872	0.49858
YA_DRIN	0.41575	0.40236	0.40155	0.3784
A_DRIN	0.5055	0.4793	0.50006	0.4993
OA_DRIN	0.51959	0.53326	0.61963	0.55938
OWNDEF2	1	0.72044	0.60016	0.64041
PRONA2	0.72044	1	0.53966	0.61672
FRIDRIN2	0.60016	0.53966	1	0.64347
PRFDRI2	0.64041	0.61672	0.64347	1
PHYREIN2	0.57714	0.59291	0.51321	0.5438
REWCOST2	0.66545	0.6579	0.53382	0.64483
YFREQUAL2	0.64195	0.5551	0.63545	0.59367
MFREQUAL2	0.56489	0.47042	0.56532	0.52094
OWNDEF3	0.65501	0.64973	0.56427	0.6027
PRONA3	0.52008	0.61131	0.46251	0.51161
FRIDRIN3	0.50767	0.47373	0.65393	0.59251
PRFDRI3	0.60882	0.58429	0.68369	0.71637
PHYREIN3	0.5494	0.50345	0.50738	0.56516
REWCOST3	0.5892	0.54378	0.53682	0.59782
YFREQUAL3	0.61311	0.5314	0.64324	0.61726
MFREQUAL3	0.61866	0.52732	0.63001	0.60416

	PHYREIN2	REWCOST2	YFREQUAL2	MFREQUAL2
OWNDEF1	0.49452	0.60114	0.61581	0.57377
PRONA1	0.46682	0.5641	0.54232	0.46387
FRIDRIN1	0.43401	0.50492	0.58827	0.54426
PRFDRIN1	0.48084	0.55007	0.59404	0.54371
PHYREIN1	0.60529	0.62371	0.70691	0.63524
REWCOST1	0.58615	0.72689	0.67151	0.59808
YFREQUAL1	0.63319	0.68271	0.8507	0.78333
MFREQUAL1	0.63888	0.67572	0.83603	0.78845
DRINKDUN	0.42657	0.4404	0.51854	0.49025
YA_DRIN	0.35439	0.33944	0.34416	0.30645
A_DRIN	0.41397	0.4833	0.49811	0.4536
OA_DRIN	0.49851	0.52739	0.61168	0.54532
OWNDEF2	0.57714	0.66545	0.64195	0.56489
PRONA2	0.59291	0.6579	0.5551	0.47042
FRIDRIN2	0.51321	0.53382	0.63545	0.56532
PRFDRIN2	0.5438	0.64483	0.59367	0.52094
PHYREIN2	1	0.8031	0.69891	0.60778
REWCOST2	0.8031	1	0.71628	0.61791
YFREQUAL2	0.69891	0.71628	1	0.9056
MFREQUAL2	0.60778	0.61791	0.9056	1
OWNDEF3	0.52984	0.63891	0.58701	0.48707
PRONA3	0.42818	0.49131	0.47136	0.44683
FRIDRIN3	0.44657	0.52682	0.59387	0.52717
PRFDRIN3	0.53165	0.62176	0.66138	0.59789
PHYREIN3	0.59591	0.62587	0.61129	0.51839
REWCOST3	0.57026	0.6704	0.59831	0.54972
YFREQUAL3	0.65293	0.67724	0.8912	0.83322
MFREQUAL3	0.63245	0.65115	0.88772	0.83053

	OWNDEF3	PRONA3	FRIDRIN3	PRFDRIN3
OWNDEF1	0.64264	0.50312	0.48073	0.60821
PRONA1	0.61882	0.54657	0.46768	0.58525
FRIDRIN1	0.51214	0.43368	0.53337	0.63946
PRFDRIN1	0.57911	0.40833	0.63325	0.72098
PHYREIN1	0.57904	0.40445	0.54072	0.58091
REWCOST1	0.66087	0.53688	0.54299	0.62983
YFREQAL1	0.59742	0.4418	0.59403	0.6281
MFREQAL1	0.58036	0.4307	0.5768	0.6156
DRINKDUN	0.4713	0.41694	0.50234	0.61361
YA_DRIN	0.31564	0.30747	0.27258	0.40391
A_DRIN	0.44095	0.36378	0.38264	0.51272
OA_DRIN	0.58425	0.46639	0.54919	0.61482
OWNDEF2	0.65501	0.52008	0.50767	0.60882
PRONA2	0.64973	0.61131	0.47373	0.58429
FRIDRIN2	0.56427	0.46251	0.65393	0.68369
PRFDRIN2	0.6027	0.51161	0.59251	0.71637
PHYREIN2	0.52984	0.42818	0.44657	0.53165
REWCOST2	0.63891	0.49131	0.52682	0.62176
YFREQAL2	0.58701	0.47136	0.59387	0.66138
MFREQAL2	0.48707	0.44683	0.52717	0.59789
OWNDEF3	1	0.56636	0.55591	0.59759
PRONA3	0.56636	1	0.34384	0.50511
FRIDRIN3	0.55591	0.34384	1	0.70581
PRFDRIN3	0.59759	0.50511	0.70581	1
PHYREIN3	0.56136	0.5121	0.4405	0.52931
REWCOST3	0.60628	0.57092	0.43578	0.56649
YFREQAL3	0.5978	0.50437	0.58983	0.67248
MFREQAL3	0.57728	0.48787	0.58822	0.66232

	PHYREIN3	REWCOST3	YFREQUAL3	MFREQUAL3
OWNDEF1	0.46212	0.57694	0.56051	0.55076
PRONA1	0.50929	0.57923	0.52183	0.50856
FRIDRIN1	0.40467	0.54388	0.57851	0.55822
PRFDRIN1	0.45202	0.54354	0.60574	0.5926
PHYREIN1	0.57102	0.57458	0.66898	0.65262
REWCOST1	0.59777	0.67196	0.63929	0.62635
YFREQUAL1	0.58424	0.61489	0.80603	0.79602
MFREQUAL1	0.54013	0.60462	0.79166	0.78058
DRINKDUN	0.44667	0.54148	0.53162	0.53487
YA_DRIN	0.29293	0.32673	0.3049	0.27193
A_DRIN	0.40405	0.43687	0.45165	0.44161
OA_DRIN	0.53478	0.60346	0.60558	0.59699
OWNDEF2	0.5494	0.5892	0.61311	0.61866
PRONA2	0.50345	0.54378	0.5314	0.52732
FRIDRIN2	0.50738	0.53682	0.64324	0.63001
PRFDRIN2	0.56516	0.59782	0.61726	0.60416
PHYREIN2	0.59591	0.57026	0.65293	0.63245
REWCOST2	0.62587	0.6704	0.67724	0.65115
YFREQUAL2	0.61129	0.59831	0.8912	0.88772
MFREQUAL2	0.51839	0.54972	0.83322	0.83053
OWNDEF3	0.56136	0.60628	0.5978	0.57728
PRONA3	0.5121	0.57092	0.50437	0.48787
FRIDRIN3	0.4405	0.43578	0.58983	0.58822
PRFDRIN3	0.52931	0.56649	0.67248	0.66232
PHYREIN3	1	0.68733	0.64872	0.59372
REWCOST3	0.68733	1	0.64765	0.63278
YFREQUAL3	0.64872	0.64765	1	0.95287
MFREQUAL3	0.59372	0.63278	0.95287	1

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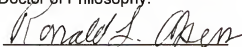
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BIOGRAPHICAL SKETCH

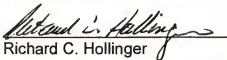
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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



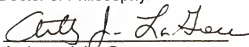
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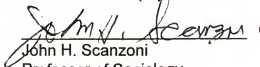
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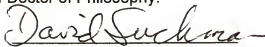
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This dissertation was submitted to the Graduate Faculty of the Department of Sociology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1997

Dean, Graduate School